

Central Highlands Natural Resource Management Plan

Prepared by **CHRRUP**
December 2003



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Cover Photo: Bridled Nail-tailed Wallaby



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Table of Abbreviations

Abbreviation	Means
BMP	Best Management Practice
CHNRMG	Central Highlands Natural Resource Management Group
CHDC	Central Highlands Development Corporation
CHRRUP	Central Highlands Regional Resources Use Planning Co-operative
COSS2	Central Queensland Strategy for Sustainability – Part Two
COANM	Central Queensland – A New Millennium
CRC	Co-operative Research Centre
DCCA	Dawson Catchment Co-ordinating Committee
DNR	Department of Natural Resources and Mines
DPI	Department of Primary Industries
EMOS	Environmental Management Overview Strategy
EMS	Environmental Management System
EPA	Environmental Protection Authority
FBA	Fitzroy Basin Association
FFFA	Fitzroy Food and Fibre Association
GBRMPA	Great Barrier Reef Marine Park Association
GOAL	Good Quality Agricultural Land
IPA	Integrated Planning Act
IAWM	Integrated Area Wide Management
LWMP	Land and Water Management Plan
LRA	Land Resource Areas
NAPSWQ	National Action Plan for Salinity and Water Quality
PMP	Property Management Plan
PRMP	Property Resource Management Plan
RCC	Regional Co-ordinating Committee (of CHRRUP)
ROP	Resource Operation Plan
RVMP	Regional Vegetation Management Plan
WRP	Water Resource Plan





Introduction

The purpose of the Central Highlands Natural Resource Management Plan is to help create a more healthy and sustainable relationship between use of the land and water resources and the natural environment.

The plan will be used as a tool for future planning and protection of the natural resources of the Central Highlands. It identifies the assets that the community wants to protect and the subsequent pressures that need to be managed to ensure that the viability of the Central Highlands remains.

This plan draws together a wealth of information relating to the management of natural resources in Central Queensland. Information has been gathered from State and Local Government, landholders, community groups and industry.

This plan was developed with strong input and participation from the local community and was guided by the Central Highlands Regional Resources Use Planning Co-operative (CHRRUP) Regional Co-ordinating Committee (RCC).

Central Highlands Regional Resources Use Planning Co-operative (CHRRUP)

CHRRUP was established as a 3-year planning project in July 1997 and has continued since then. The aim of the group is to improve the sustainability of resource use and management in the Central Highlands region of Queensland.

CHRRUP is a community-based organisation that helps existing sectors in the region improve their regional planning by assisting greater communication within and between sectoral groups. Successful resource management depends on the development of trust, relationships, co-operation and co-ordination among people.

CHRRUP is represented by 13 sectors within the Central Highlands. These are:

- Landcare
- Local Government
- State Government
- Indigenous
- Pastoral
- Grains
- Catchment Groups
- Environment
- Human services
- Tertiary/education
- Economic development
- Mining
- Food and Fibre

The Central Highlands is a well-defined sub-regional community within Central Queensland. It comprises a unique set of geographic and sectoral interests. This Plan represents the collation of the full set of natural resource strategies being developed by the CHRRUP sectors as well as other regional groups not formally associated with CHRRUP.



The Central Highlands Natural Resource Management Plan

The Central Highlands Natural Resource Management Plan, 'the Plan' is the primary planning framework for land, water and biodiversity in the Central Highlands. The Plan has been developed by people living and working in the Central Highlands in close consultation with the regional community, other regional organisations, other catchment organisations and State and Federal Government.

The management of our natural resources has been the driving force behind many organisations over the past few years as the community has become more aware of issues regarding the decline in the condition of the environment.

The Plan ensures coordination and integration of a wide range of regional activities in the Central Highlands. It also provides an opportunity to seek direct feedback from the Highlands community about the strategic direction that the Plan is taking.

The development of the Plan reflects the commitment of natural resource management agencies across the region to the principles of integrated catchment management, sustainability and adaptive management.

Outlined below is the framework of the Plan:

- The Central Highlands and Natural Resource Planning – why this plan now.
- Linkages to other plans in the region – plans that influence and link to this plan.
- Regional Overview – characteristics of the Central Highlands
- Vision of the Central Highlands – desire of the Central Highlands community
- Objectives and goal for Natural Resource Management – what the region hopes to achieve
- Guiding principles for Natural Resource Planning – what is good natural resource management
- Targets – what are they? What will they help us achieve
- Regional strategies to address Natural Resource Planning – the way forward
- How the plan will be reviewed – are we meeting our targets?

Other documents that will play a major role in the implementation of the plan are:

- Communications Strategy – reporting and communication of the success of the plan in protecting regional assets
- Investment Plan –prioritises projects for future investment
- Monitoring and Evaluation Framework – provides a base for reporting on the implementation of the plan and monitoring of environmental indicators

These documents have/will be developed by CHRRUP for the implementation and coordination of the Plan. The Communications Strategy is being developed at a regional level by the Fitzroy Basin Association, in consultation with CHRRUP.



The Need for a Natural Resource Management Plan in the Central Highlands

The management of natural resources in Queensland has changed significantly in recent years. Changes have been driven by: -

- A growing awareness of the seriousness of environmental decline and its likely impact,
- The increase in community expectations of the condition of the natural resources
- Community interest and desire for involvement in decisions affecting natural resources, and
- Recognition that environmental considerations will play a growing role in consumer purchasing preferences.

The Plan nominates different management actions to protect the natural resource assets in the region and provide strategic direction in the management of many threats and pressures to the current condition of the Central Highlands. The management of our local waterways and concerns in potential risks of salinity have also been addressed in the Plan. A range of existing plans and actions are relevant to the development of a regional natural resource management plan for the Central Highlands.

National Action Plan for Salinity and Water Quality

On 1 March 2002, the Queensland Government and the Commonwealth Government signed a bilateral agreement for each to invest up to \$81 million in the National Action Plan for Salinity and Water Quality (NAPSWQ) in four priority regions in Queensland. This sub-regional plan along with other sub-regional plans will underpin the regional Fitzroy Natural Resource Management Plan. The Fitzroy Natural Resource Management Plan will be the key document for determining priority activities across the Fitzroy Basin.

State of the Region Report

The Fitzroy Basin Association contracted the Coastal CRC to undertake an information paper outlining the current condition of the catchment, identify the assets for protection and the subsequent threats on the assets specific to Central Queensland.

CQ A New Millennium Regional Growth Management Framework (CQANMRGMF) - 2002

The CQANMRGMF is a broad-based regional plan focussing on regionally significant issues across environment, economic and social dimensions.

Central Queensland Strategy for Sustainability (CQSS)

The CQSS was developed as part of the Fitzroy Basin's Integrated Catchment Management process. The CQSS is an endorsed catchment plan, and was launched in February 2001.

Central Highlands Rolling Regional Audit

The Rolling Regional Audit was developed by the CHRRUP sectors in May 2001. It provided useful information to stakeholders relating to the current situation and future trends in relation to priority issues in the Central Highlands.

The Central Highlands Natural Resource Management Plan seeks to compliment and enhance other planning processes and strategies across the region by providing linkages to all of the other plans in the region, while identifying and addressing the goals of the Central Highlands region. This sub-regional plan will assist in the implementation and achievement of targets in regional plans at a sub-regional level.



The purpose of Associated Action Plans and Documents

The Plan addresses the protection of natural resource management assets at a sub-regional level. It will operate within a broader planning context, and is aligned with other strategic planning activities, which operate at different scales, from the paddock to the catchment.

The Plan will compliment and link to all current planning for the Central Highlands with a focus on natural resource management at a sub-regional level. The following information outlines the current planning framework and linkages to different policy and legislation relating to the protection of our natural resources. Figure 1 provides a visual representation of the relationship between different plans/strategies/policies that are relevant to natural resource planning in Central Queensland.

Federal Government Acts and Strategies

Many of the federal strategies established under legislation guide natural resource management at a National level, such as the EPBC Act. Federal, State and Local Government Acts are enforceable by law. Other programs such as the National Action Plan for Salinity and Water Quality and National Dryland Salinity Program guide natural resource management at a Federal level.

Queensland Government Acts and Strategies

The State Government has enacted legislation specific to Queensland's management of the environment. Many Acts prescribe for the development of management plans. For example, under the Land Act 1994, there has been a State Rural Leasehold Land Strategy developed by the Department of Natural Resources and Mines.

Local Government Acts and Strategies

Local Government Planning Schemes are statutory plans under the Integrated Planning Act 1997. By developing and implementing a planning scheme, Local Government aims to manage growth and change in their local government area while coordinating and integrating planning at the local, regional and state levels. These schemes aim to achieve ecological sustainability.

Industry Codes of Practice

Industry Codes of Practice are a collection of voluntary rules or procedures drafted in response to s.436 of the Environmental Protection Act 1994. Generally, industries or industry associations that want to take a step toward greater environmental responsibility prepare these codes. Compliance with the codes is voluntary.

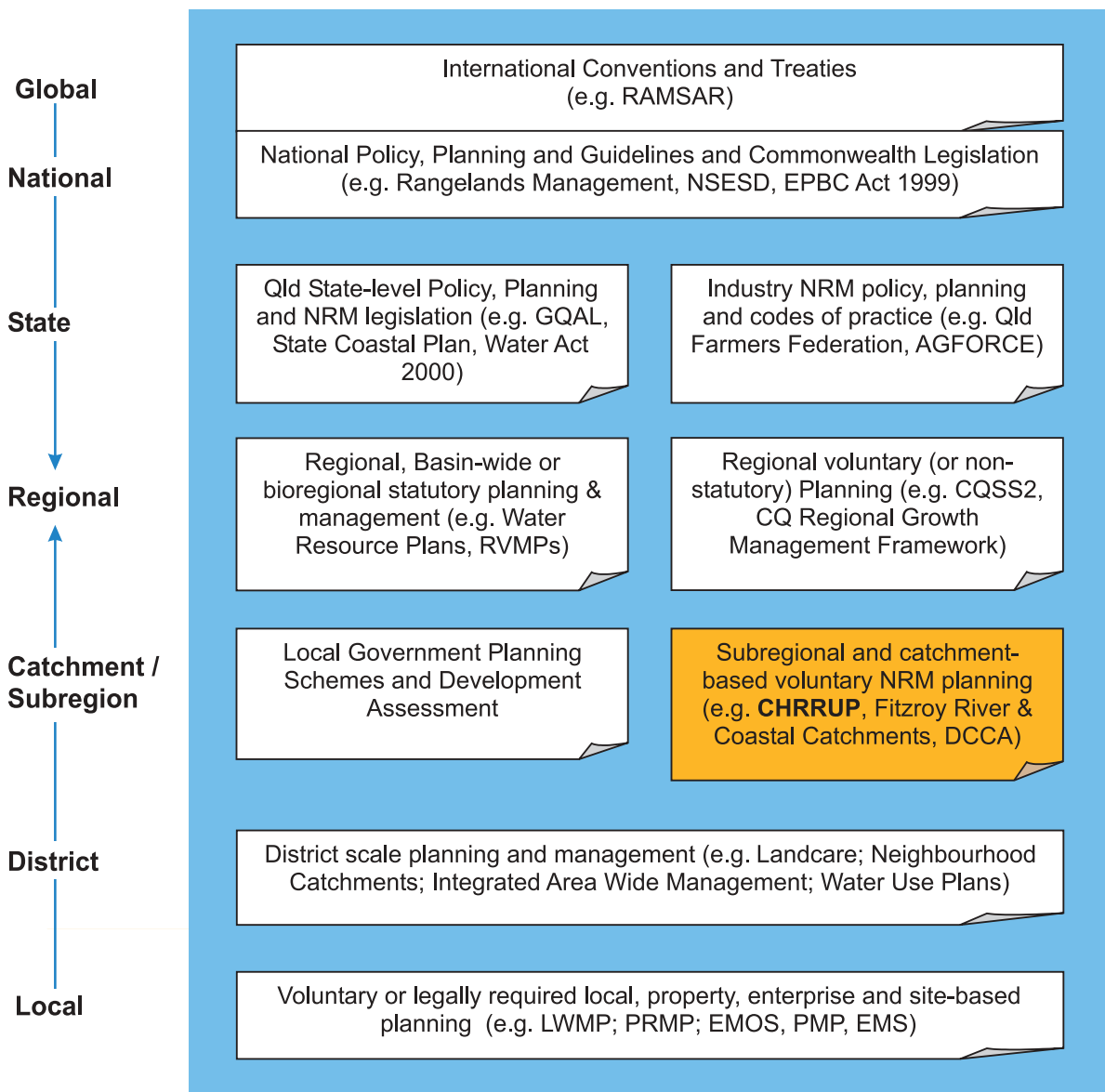
Industry-led improved practice programs also exist. These are voluntary best practice/recommended practice guidelines designed and developed by various industries to assist primary producers. An example is Cotton Australia's Best Management Practice (BMP) Program.

Regional Plans

Planning processes in this category are generally undertaken on a voluntary basis by participating organisations and individuals who see the need to coordinate natural resource management to achieve common goals. Regional plans focus on specific issues and provide direction for the management of natural resources at a regional level, e.g. Central Queensland Strategy for Sustainability and the CQ A New Millennium Regional Growth Management Framework. It also shows what processes/regulations have informed the Plan.



Figure 1. NRM policy, planning and management activities at different scales influencing the Central Highlands Natural Resource Management Plan development and implementation





Development of the Central Highlands Natural Resource Management Plan

Many organisations and individuals have been involved in the development of the Plan, subsequent sub-regional plans and the overarching regional plan. Listed below is an outline of the key organisations involved. Other key organisations involved in the development of the Plan are set out in Appendix 3.

The Fitzroy Basin Association

The Fitzroy Basin Association (FBA) is a community-based organisation that promotes sustainable development in Central Queensland. FBA represents those who have a stake in the use and management of natural resources of the Fitzroy Basin.

Central Highlands Regional Resource Use Planning Co-operative

The aim of the group was to improve the sustainability of resource use and management in the Central Highlands region of Queensland.

The Vision and Objectives of the Central Highlands Regional Resources Use Planning Co-operative (CHRRUP).

The vision statement for CHRRUP is:

CHRRUP is focussed on building a better system of planning for a viable and sustainable future for Queensland's Central Highlands

The objectives of CHRRUP

- Supporting key sectoral groups to undertake their own regional planning
- Encouraging greater coordination and negotiation among the sectors
- Providing a range of technical services to support these planning processes

Communication of the plan

During the development of the plan, CHRRUP has informed the community of the process through industry meetings, faxing, media, organisational newsletters and letters. The main aim of the Plan was to build the required management actions from the ground up.

Information days were held throughout the region. These focussed on the development of targets, and identifying assets and threats specific to the Central Highlands. Two workshops were then held to:

- identify the desired resource condition targets; and
- develop management actions to meet these resource condition targets.

There were approximately 70 landholders and 30 organisational representatives at both sessions. Various organisations provided expert advice at the meetings, including CHNRMG, AgForce, NR&M, EPA and DPI. CHRRUP was also present at all meetings to help ensure that the community agrees to the proposed outcomes of the Plan. The Plan comprises the identified assets and threats to the region, resource condition targets that outline how the community would like to see natural resource assets in the future and management action targets that recognise the processes to reach the outlined resource conditions. Land managers will play an important role in the implementation of the plan. The community and land managers have developed the targets identified in the following pages and there is a strong commitment to ensure that the targets are addressed.



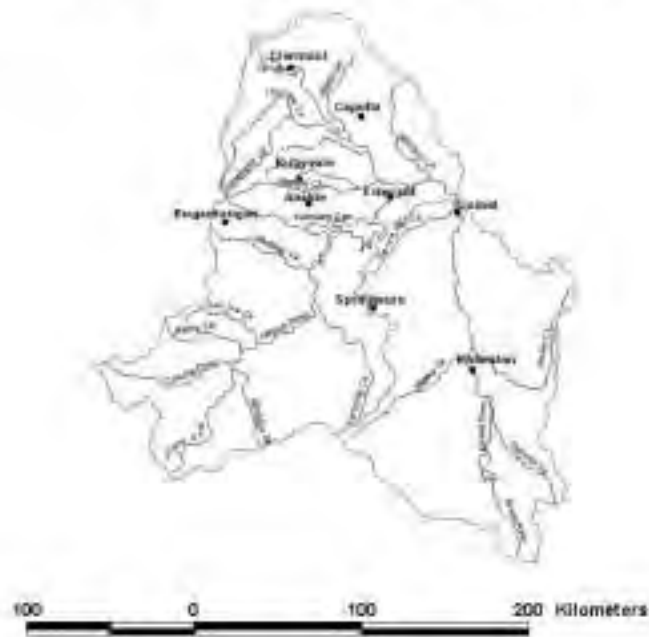
The Central Highlands Region

The Central Highlands region is approximately 270km inland from Rockhampton, Queensland. It encompasses the Shires of Bauhinia, Belyando, Emerald, Peak Downs and Jericho. Major townships of the region include Emerald, Springsure, Rolleston, Capella, Clermont; and the world-renowned gemfield towns of Rubyvale, Sapphire, Anakie and The Willows. Western portions of Broadsound and Duaringa Shires strongly relate to the Highlands, as does the Eastern side of the Jericho Shire.

Whilst CHRRUP's responsibilities extend across five shires, the Plan is specifically focussed on the Comet and Nogoia catchments.

Figure 2. Map of Comet and Nogoia Catchments

Comet & Nogoia Catchments





The Highlands covers 4,479,845 Ha and supports extensive and intensive primary production, mining (coal, gold and sapphires) and an emerging tourism industry (Figure 4). These industries are supported by industrial, commercial and service sectors and an excellent transport and logistics infrastructure.

The future of the region depends on the sustainable and fair use of our natural resources. This strategic plan recognises that much work is needed to achieve this, and its implementation will require all those with an interest in the region's future to work together.

Description of the Central Highlands

The Central Highlands has an indigenous history. While the exact nature of pre-European clan territories, demography, culture and economy are not known; some indication of the complex network of traditional owner groups that existed prior to European settlement can be gleaned from the current makeup of the Fitzroy Basin Committee of Elders.¹

The region was opened up to European settlement following its discovery by the explorer Ludwig Leichardt in 1844-45, and the subsequent rapid spread of the pastoral industries westward as well as the discovery of gold in the region in the 1860's and 1870's.

In 1944, the Queensland Government officially defined the Central Highlands as a 'region' on the basis of "soil, climate and mineral resources special geographic features, communication facilities, existing centres of population and commerce and existing local authority boundaries".²

The Plan has been developed to be implemented at a catchment scale. This includes the Nogoia River and Theresa Creek Catchment and the Comet River Catchment. The shire boundaries of Jericho and Belyando are part of the Central Highlands, but not within the scope of the Plan. However, many of the actions identified in the plan will be implemented outside the catchment boundaries.



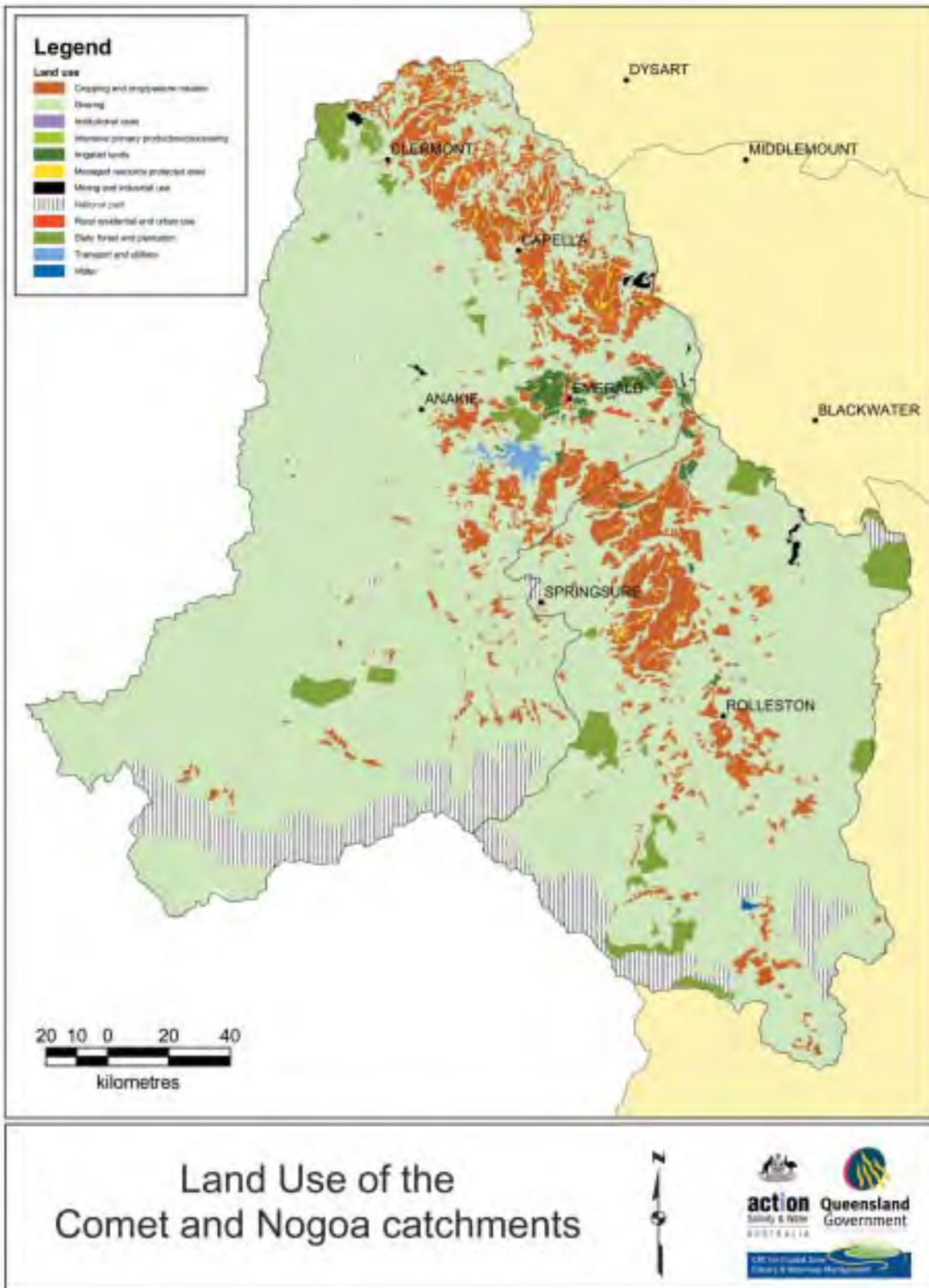
Figure 3. Undulating downs of the Central Highlands
Photo courtesy of Department of Natural Resources and Mines, Emerald

¹ Central Highlands Rolling Regional Audit

² Commonwealth of Australia, 1949:11-12



Figure 4. Land use in the Central Highlands





Population and Demographics

The Central Highlands supports a population of approximately 20,000 people. This population is concentrated in the major townships of Emerald, Springsure, Rolleston, Capella and Clermont.³ The Bauhinia, Belyando, Emerald and Peak Downs local government areas service the Nogoia catchment. The Bauhinia and Emerald local government areas service the Comet catchment.

The Central Highlands region has experienced an increase in population of 6% over the 10-year period 1991 - 2001. Overall population growth rates in the Central Highlands are slower than in Queensland as a whole.⁴

The largest land use in the catchments is agriculture, primarily grazing. Cotton production in the Emerald shire is the highest for the region at approximately \$53.4m in 2001. The land use with the greatest economic contribution to the local economy is mining (\$208m in 2001).⁵

Climate

The Central Highlands experiences a sub-tropical climate characterised by high variability in rainfall, temperature and evaporation. Droughts, floods, heatwaves and frosts all feature as part of the local climate.⁶

Rainfall is the most limiting factor to land use production. 70-75% of the annual rainfall occurs in the summer months (October to March). Most rain between September and December is from thunderstorms, whose high intensity produces run-off and consequent soil erosion problems. January and February are the wettest months with rainfall averaging 100 to 120mm per month. August is usually the driest month averaging 18-25mm. Severe droughts can be expected to occur once every 10 to 15 years.⁷

Drought

In general, the term drought means an acute water shortage caused by a serious or severe rainfall deficiency (lowest 10% of records) over a period of three months or more. In Australia there are generally about three good and three bad rain years out of ten. For the 14-month period from December 2001 to January 2003, serious to severe rainfall deficiencies covered the vast majority of Queensland, including the CQ region.

As Australia is the driest inhabited continent, we must be able to adapt to drought conditions and manage our natural resources under such conditions. A key challenge is to be better prepared for drought when it inevitable comes. The effects of drought differ between industries, as does the impact of drought-breaking rain. Droughts reduce vegetation growth and surface cover for all vegetation types, leaving the catchment highly susceptible to the erosive effects of high intensity rainfall. Infiltration is lower and runoff is higher under lowered ground cover. Retention of surface cover during droughts is therefore a high priority.

³ Central Queensland Information Paper Vol.1

⁴ Central Highlands Rolling Regional Audit

⁵ Central Highlands Rolling Regional Audit

⁶ Central Highlands Rolling Regional Audit.

⁷ Understanding and managing soils - Resource Information



Landscape

The Comet, Nogoia and Theresa Catchments are made up of ranges and tablelands with large areas of brigalow plains, eucalyptus clay uplands and undulating downs⁸. Each area is identified and mapped as Land Resource Areas (LRA) and is shown in Figure 6.

The Central Highlands is able to support many different industries due to the diversity of landscape and soils. There is sufficient diversity to support successful grazing, cropping and irrigation industries in the Central Highlands.

Table 1 outlines the characteristics of the different Land Resource Areas (LRA), their suitability to different management practices and susceptibility to erosion. Land types are grouped by vegetation, then soil geology and topography.

Table 1. Summary of Landscape and soil characteristics

LRA	Communities	Soil Characteristics	Land suitability	Limitations	Susceptibility to erosion
Alluvial Plains	Dense brigalow and coolibah shrub	Heavy cracking clay with a strong but thin mulch	Cropping	Pasture improvement difficult Regrowth	Moderate erosion hazard High soil erosion when cultivated
	Tall open woodlands of coolibah with associated black tea tree, brigalow and yellowwood	Medium cracking clay	All cropping Pasture improvement difficult	Flooding Salinity	Moderate erosion hazard
	Open woodlands of poplar, brigalow and bauhinia	Cracking and non-cracking grey to brown clay	Cropping Highly productive buffel grass	Sodic and saline soils	Low erosion hazard
	Open grass lands with associated, severely stunted brigalow clumps	Cracking and non-cracking grey to brown clay	Grazing native pastures	Low fertility salinity	Low erosion hazard
	Tall woodland of blue gum and Moreton Bay ash	Sandy loam surface soil	Grazing only	Weed invasion	Low erosion hazard
Undulating Scrub Plains	Scrub brigalow with emergent eucalypts	Red-brown clay loams over medium clays	Cropping on soils deeper than 45cm and on slopes less than 4% Reasonable soils for pasture improvement	Regrowth of some species	High erosion hazard when cultivating
	Brigalow, Dawson gum, Silver Leafed Ironbark	Heavy cracking clay soils	Cropping Suitable for pasture improvement	Excessive regrowth	Moderate soil erosion when cultivated
	Brigalow scrub	Grey and brown clays	Moderate grazing pasture	High salinity	Low soil erosion
	Fairly dense scrub consisting of brigalow and yellowwood	Deep red, brown to grey cracking clays	Cropping Highly productive buffel	Surface sealing	High erosion hazard

⁸ Central Queensland Information Paper Vol.1



	Brigalow, Dawson gum with Gidgee and Blackwood in the north	Deep cracking grey to brown clays, with highly weathered sediment	Cropping Moderate grazing production	Salinity Regrowth	Low to medium erosion hazard
	Red to brown cracking and non-cracking clays	Woodlands or scrub with a range of species	Cropping Productive buffel	Low production of native pastures	Medium soil erosion
	Brigalow, Belah, Dawson gum and Yellowwood scrub	Grey to brown duplex soils with thin sandy surface	Cropping Low nature pasture High productive buffel	Weed infestations Nutrient decline	High soil erosion hazard
Eucalypt Duplex Plains	Woodlands of narrow-leaved ironbark and silver-leaved iron bark	Yellow-brown sandy duplex surfaces overlaying clay subsoils	Generally suitable for pasture improvements Unsuitable for cropping	Low soil moisture Low soil fertility	Extremely high erodible soils
Undulating Downs	Open woodlands of mountain coolibah, bloodwood, and silver leaved iron bark Ground cover of bluegrass and Mitchell grass	Shallow cracking and non-cracking clays Frequently stony	Highly production native pastures	Shallow soil depth	Very high soil erosion
	Bluegrass tussock grassland	Black cracking clays with fine granular surface mulch	Cropping	Surface sealing	High soil erosion
	Open grassland of bluegrass, spear grass, Mitchell grass with scattered mountain coolibah, bloodwood	Deep, cracking dark clays on basalt	Cropping Productive pastures (native and sown)	Fertility Surface stone	High soil erosion
Plateaus	Tall bloodwood and ironbark open woodlands	Deep red and yellow sandy soils Shallow and rocky soils	Unsuitable for cropping Suitable for pasture	Unsuitable for clearing Weed infestations	Low soil erosion
Ranges	Open box ironbark woodlands	Shallow rocky soils	Some timber harvesting	Unsuitable for crop or pasture	Steep slopes High erodibility

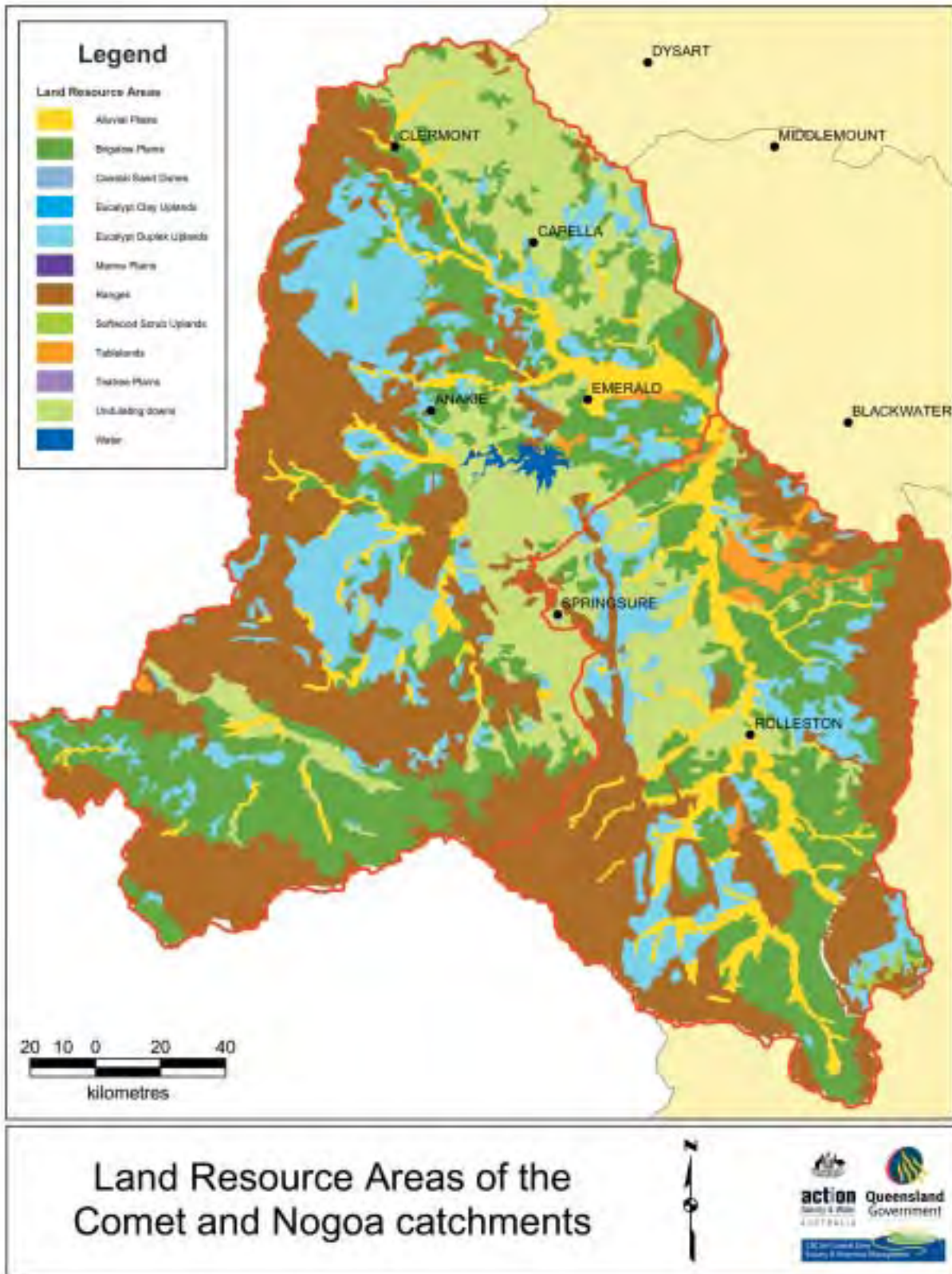


Figure 5. Brigalow scrub, Emerald

Photo courtesy of Ken Dixon, Department of Natural Resources and Mines, Emerald



Figure 6. Land Resource Areas for the Central Highlands





Groundwater and Salinity

Groundwater in the Central Highlands is sourced from alluvial aquifers in the alluvial plains LRA; some sedimentary aquifers supply the south Nogoia catchment, and fractured rock aquifers supply the remainder of the area.⁹

Groundwater from approximately half the catchment is considered to be highly saline.¹⁰ Salinity results from the concentration of salts in the soil root zone by evaporation from a shallow (close to surface) watertable. This is a naturally occurring event, but can be accelerated by different land management practices.

Salts occur naturally in the soil from the weathering of rocks and deposition by rain. When land development practices raise the watertable, the salt store moves toward the soil surface. Rising water tables that result in salinity may be caused either by excessive irrigation or by additional water movement through the soil profile due to the replacement of native vegetation, such as trees, with lower water using crops or pastures (dryland salinity).¹¹

Regional Rivers

The area identified in this plan incorporates two major river systems.

The Nogoia River and its tributaries have a catchment area of Approximately 27,676 km². The main tributaries in the catchment are Theresa Creek, which is in the northern part of the catchment. The Drummond and Zamia Ranges bound the Nogoia River to the West, by the Denham Ranges to the east and southeast by the Buckland Tablelands.¹²

Southern tributaries (smaller streams that flow into the River) of the Nogoia River are Claude River, Wharton, Buckland, Reedy, Vandyke, Cona, Freitag and Ramrod Creeks, all flowing in a northerly direction and Medway Creek and Balmy Creek flowing in a southerly direction. The Nogoia River flows into the Fairbairn dam, which has been identified as one of the major water resource assets in the Nogoia Catchment.

Theresa Creek flows into the Nogoia River on the Eastern Side of Emerald. The main tributaries of Theresa Creek are Tomahawk Creek, Huntley Creek, Capella Creek, Arbor Creek and Crinum, Belcong and Gordonstone Creeks. Other tributaries of Theresa Creek include Retreat, Kettle, Carbine, Sandy, Retro, Magenta and Wolfgang Creeks.

The Comet Catchment is bounded by the Expedition and Shotover Ranges to the southeast, the Carnarvon Range to the south and bordered by the Buckland Tableland on the West. The main tributaries on the Comet River, all flowing south to north, are the Sandhurst, Springsure and Minerva Creeks, the Meteor and Orion Creeks, all on the western side. On the eastern side of the Comet River are the Sirius, Humboldt, Rockland, Christmas Creeks and the Brown River. Other eastern tributaries in the Comet Catchment are Canary, Clematis, Arcadia and Planet Creeks. Other southern tributaries on the western side of the Comet River include Consuelo, Peawaddy, Yellowbelly, Carnarvon and Moolayember Creeks.¹³

The Comet and Nogoia River come together to form the Mackenzie River at the township of Comet.

⁹ State of the Land

¹⁰ Understanding and managing soils - Resource Information.

¹¹ State of the Land

¹² State of the Rivers – Comet, Nogoia and Mackenzie Rivers

¹³ State of the Rivers – Comet, Nogoia and Mackenzie Rivers



Regional Vegetation

The Central Highlands is classified as part of the Brigalow Belt bio-region. Under the Regional Vegetation Management Plan for the Southern Highlands there are 81 regional ecosystems that have been classified to enable a distinction between endangered and non-endangered vegetation types in the plan. In the Central Highlands, 19 'Endangered' regional ecosystems have been classified as protected and 21 'Of Concern' regional ecosystems.

An **endangered** regional ecosystem is a regional ecosystem that has either (a) less than 10% of its pre-clearing extent remaining; or (b) 10-30% of its pre-clearing extent remaining and the remnant remaining vegetation is less than 10,000 ha. Endangered regional ecosystems within the Central Highlands are identified in Appendix 2.

An **of concern** regional ecosystem is a regional ecosystem that has either (a) 10-30% of its pre-clearing extent remaining and is greater than 10,000 ha; or (b) more than 30% of its pre-clearing extent remaining and the remnant remaining vegetation is less than 10,000 ha. Of concern regional ecosystems within the Central Highlands are identified in Appendix 2.

A **not of concern** regional ecosystem is a regional ecosystem that has greater than 30% of its pre-clearing extent remaining and the remnant remaining vegetation is more than 10,000 ha.

Over the years there have been large modifications made to remnant vegetation. The following table shows the changes to remnant vegetation over time. The information provided is only current to 2001. All areas of management are included in the table eg. Leasehold, freehold and National Parks.

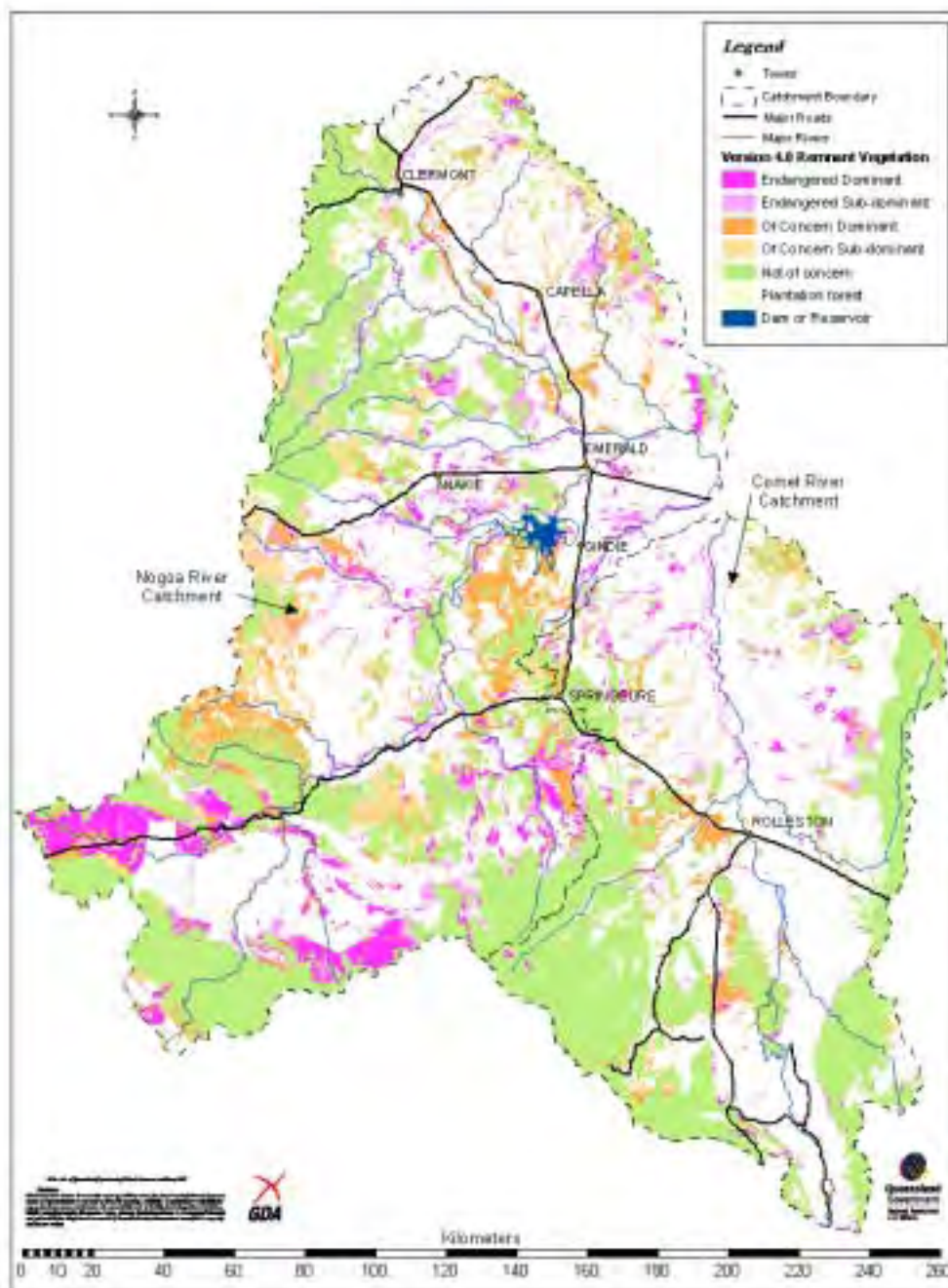
Many endangered regional ecosystems are protected from clearing. The Regional Vegetation Management Plan prescribes for the protection of 30% vegetation cover for the whole region.

Table 2. Changes to vegetation cover in the region

Catchment	Pre clearing (ha)	% of pre-clearing extent remaining in 2001
Comet Catchment	1615079	44 %
Nogoa Catchment	2865915	52 %



Figure 7. Regional Ecosystems in the Central Highlands





Assets of the Central Highlands and subsequent threats to them

To develop the plan and targeted actions, we needed to first identify the assets that the community wanted to protect. Table 3 outlines these assets and the threats to these assets. The protection of the assets formed the basis of actions in the Plan. This table also helps establish a priority system for the management actions set out in the Plan. There is no significant order to the assets. Prioritisation of actions is described in more detail later in the Plan.

Table 3. Assets and Threats register

Regional strategies	Assets	Threats	Addressed in the NRM Plan
Land Use and Management	<ul style="list-style-type: none"> • Productive dryland cropping, irrigated, and grazing lands • Water resource infrastructure for water supply and recreation – Fairbairn Dam • Coal mining is a significant asset to the economy • Gemfields – gemstones, gold • Well established rural services, facilities and local manufacturing • Urban lands – areas surrounding Emerald, Springsure, Rolleston, Capella. • Transport lands (good rail, roads and airport) • Primary, secondary and tertiary institutions • Good stock routes and reserves • State Forests • Feedlots • Aquaculture • Organic farming • A wealth of indigenous Cultural Heritage and knowledge of land management • Strong Aboriginal connections to land in the Central Highlands 	<ul style="list-style-type: none"> • Soils with high clay content • Moderate-high rates of hillslope erosion • Low amounts of surface cover • Inappropriate land clearing • High inputs to agricultural systems • Centralisation of services • Drought followed by high intensity storms • Pest plants and animals • Mining pollution • Lack of understanding/appreciation of Aboriginal values • Little recognition of native title rights and consequent lack of access by Aboriginal people to land and influence in land management decision-making 	<p>Land Management Issues are specifically addressed in the land management actions – 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7.</p> <p>Actions that reduce the threat to land assets are included in section 2.4 of the Plan. Coordination of the management of assets is detailed in Section 6</p>
Biodiversity	<ul style="list-style-type: none"> • Intact natural values – Carnarvon and Drummond ranges • Wildlife refuges and corridors in particular associated with hills and ranges • Private remnant vegetation • Vegetation corridors • National Parks • Native timber 	<ul style="list-style-type: none"> • Broad scale tree clearing • Inappropriate grazing management • Alterations to wetlands • Introduced species • Mining disturbance • Unsustainable timber harvesting • Habitat fragmentation • Altered fire regimes • Environmental weeds • Invasive native species • Pest animals • Inappropriate management of all land uses • Managing thickening (regrowth) • Urban use pollution 	<p>Biodiversity issues are addressed specifically in section 2. Many of the actions look at protecting biodiversity assets. Actions that reduce the threat to biodiversity are included in section 2.4. Coordination of the management of assets is detailed in Section 6</p>
Aquatic biodiversity	<ul style="list-style-type: none"> • Long regions of uninterrupted river flow • Significant animal and plant species • Wetlands • Freshwater springs – Source of the Nogoa River • Water storages - Fairbairn Dam 	<ul style="list-style-type: none"> • Artificial barriers • Floodplain/riparian habitat modification • Altered chemistry/chemical contamination in irrigation tail waters and other waterways • Managed water flows • Algal blooms • Pest plants and animals • Agricultural production 	<p>Aquatic biodiversity management options are included in section 2. River health and water quality impact on the biodiversity of aquatic environs and are addressed in Section 3. Coordination of the management of assets is detailed in Section 6</p>



Water Quality	<ul style="list-style-type: none"> • Good water quality • Drinking water • Health of aquatic ecosystems • Primary production • Recreation and aesthetic uses • Industrial and mining use • Water allocation and management • High rainfall 	<ul style="list-style-type: none"> • Industrial development and production • Industrial use of waterways • Recreational use of waterways • Variable and irregular rainfall • High evaporation • Urban stormwater • Mines • Overland flow regulation • Lack of understanding/appreciation of Aboriginal values 	<p>Specific water quality targets are addressed in section 3.3</p> <p>Many of the actions identified in land management Section 1 impact on water quality. Coordination of the management of assets in detailed in Section 6</p>
Cultural	<ul style="list-style-type: none"> • Indigenous land uses • Landscapes, places and values 	<ul style="list-style-type: none"> • Land use change • Waterway development • Land Clearing and • Lack of access to country by aboriginal people • Legislative change • Loss of control over intellectual property • Theft and vandalism of artefacts and sites 	<p>Cultural heritage assets and threats are addressed in Section 4. Coordination of the management of assets is detailed in Section 6</p>
Economic	<ul style="list-style-type: none"> • Dryland farming • Water for irrigation • Irrigation industry • Value added agricultural products - saleyards • Mining • Coal • Gas • Road and rail transport • Tourism • Timber • Education • Cultural Centre 	<ul style="list-style-type: none"> • High dependence on world commodity prices • Limit to availability of water • Reliance on agriculture on seasonal conditions • Reduction of government services • Policy and legislation 	<p>Economic impacts are addressed in Section 5.2, and relate closely to Sections 5.1 & 5.3. Coordination of the management of assets is detailed in Section 6</p>
Social	<ul style="list-style-type: none"> • Population • Employment • Fairbairn dam • Theresa Creek dam • Education • Local skills and knowledge • Lifestyle • Telecommunications • Schools • Health Services 	<ul style="list-style-type: none"> • Aging and declining populations • High dependency on two industries for employment • Sudden removal of services • Property rights • Loss of youth • Drought • Loss of country races • Lack of adequate water supply for communities 	<p>Social issues are addressed in Section 5.1 and relate closely to Sections 5.2 & 5.3.</p> <p>All integration tools detailed in Section 6 seek to enhance the social and economic viability of the region</p>



Figure 8. National Parks - an asset identified for biodiversity and culture.

Photo courtesy of Department of Natural Resources and Mines



Targets and the Plan

A key objective of the Plan is to create management systems that allow the community, industry and government to work together to improve the health of the Central Highlands. Establishing targets provides a way to guide actions and measure progress toward desired outcomes. Targets must provide a clear point of view on what constitutes a healthy catchment and actions must aim to achieve agreed targets. Targets must be checked regularly to ensure social, economic and environmental benefits are being achieved. Therefore targets are:

- Meaningful, clearly reflecting desired outcomes
- Measurable
- At an appropriate scale
- Reflective of community, stakeholder, State and Federal Government priorities
- Timebound
- Based on the best available science
- Clearly linked to management actions
- Able to take account of the dynamic nature of the catchment
- Widely accepted by the community and stakeholders
- Reported annually in an aggregated format

Establishing targets for natural resource condition is a core component of the Plan. Targets provide guidance for the implementation of the plan from short term to long term. The three types of targets are outlined below:

Aspirational Targets

These are long term targets that reflect the desired condition of regional natural resources in the long term (50 years). These targets help guide regional planning and provide a context for setting other targets.

Aspirational targets have been determined for each of the regional strategies identified in the plan. The community in close consultation with the Fitzroy Basin Association (FBA) and CHRRUP has identified the targets.

Resource Condition Targets

These are specific timebound and measurable targets relating to resource condition and achievable within a timeframe of 10-20 years.

Setting accurate resource condition targets is a major undertaking requiring comprehensive monitoring to establish baselines and trends. Many resource condition targets identified in this plan need more investigation to get a true representation of the current status.

Management Actions

These are short-term targets relating mainly to management actions and capacity building over a 1 to 5 year time frame.

Many management actions are aimed at increasing our understanding of current trends in natural resource management. Management actions will provide information to enable the development of more comprehensive resource condition targets.



Property Management Plans & Natural Resource Management Planning

Property Management Plans play a role in providing guidance for natural resource management at a property level. Many of the Management Actions in the Central Highlands Natural Resource Management Plan focus on Property Management Plans to achieve the identified Resource Condition Targets. Property Management Plans will increase capacity, knowledge, social capital and willingness to change by catchment stakeholders.

A property management plan is a tool used by landholders to document property resources and management practices and to design property changes. Property plans have three main purposes:

- a strategy to meet financial, production and personal goals
- a management tool to develop a property in a sustainable and profitable manner; and
- a record to demonstrate that a landholder is meeting their environmental obligations in natural resource management.

There is now an array of management plans that cover different issues such as land management, water conservation, vegetation, biodiversity and pest control. These plans may be voluntary; a regulatory requirement; or needed to support an application for financial assistance. The contents of a property management plan will be specific to each individual landholder. Different industries also have requirements/ different types of plans available.

In this Plan, a reference to Property Management Plans is intended to include these specific industry initiated plans, such as:

- Cotton Industry BMP
- EMS (ISO 14001)
- Property Resource Management Plans
- Grazing Land Management (under development by DPI)
- Land and water management plans
- Vegetation management plans

A Property Management Plan should have the following minimum components:¹⁴

- Base map
- Directions and goals
- A stock take of natural resources and condition
- Indicate existing and proposed development
- Identify natural resource issues that need to be addressed
- Management strategies
- Implementation plan
- Monitoring through record keeping
- Evaluation and review of plan



Figure 9. Property management plan workshop
Photo courtesy of Department of Natural Resources and Mines

¹⁴ Property Resource Management Planning – draft guidelines for landholders, Queensland Government Department of Natural Resources and Mines (March 2003)



The Central Highlands Natural Resource Management Plan

Goal of the Central Highlands Natural Resource Management Plan

To create a more healthy and sustainable relationship between use of the land and water resources and the natural environment.

Principles

This plan is based on the following guiding principles:

- I. The importance of our natural resources
- II. The need for ecological sustainability in the management of our natural resources
- III. The recognition of the extent of degradation of our natural resources
- IV. The need to develop and sustain partnerships to achieve outcomes
- V. The importance of building capacity and supporting community action
- VI. The importance of adaptive management

Objectives

1. Represent the interests of the community in natural resource management
2. Create effective partnerships
3. Provide regional leadership in natural resource management
4. Improve wetland health
5. Improve the control of salinity
6. Protect significant remnant vegetation
7. Reduce soil loss in productive pastures
8. Increase biodiversity through corridor management
9. Increase the skills and knowledge in the region
10. Maintain and improve riverine environments throughout the Central Highlands
11. Foster regional development by ensuring supplies of high water quality for industries and communities
12. Maintain and improve the quality of surface and ground waters in the Central Highlands
13. Improve soil health
14. Encourage the uptake of sustainable farming practices
15. Support the growth of sustainable regional industries
16. Reduce the impacts of pest plants and animals
17. Effectively monitor the health of the catchment
18. Increase the involvement of indigenous, urban and rural communities
19. Promote best practice for the protection of cultural heritage in Central Highlands



Regional Strategies

The following sections outline the management actions and proposed condition of our natural resources in the future. As described above, these actions were developed by stakeholders during Stage Two meetings and are seen as priorities for implementation by the local landholders, community, industry and local and state government.

Many of the actions identified in this plan will provide positive outcomes across many of the areas of management. These actions impacting on more than one of the assets identified will be given a higher priority for implementation.

CHRRUP RCC prioritised the following resource condition targets using a multi-criteria decision making tool. Each target was prioritised against a set of criteria, which included:

- Number of assets the target protected;
- Urgency of the target to stop decline;
- Community aspiration to undertake action;
- Ability for the target to be implemented socially, economically and environmentally;
- Risk to natural resources if target not addressed;
- Whether the target would have a positive impact on our natural resources.

Implementation responsibilities for the actions are listed and the lead organisation is highlighted. Many of the actions will be implemented through existing and developed partnerships.

Implementation of many of the on-ground actions will be undertaken using the Neighbourhood Catchment approach. The Neighbourhood Catchment approach is a way of bringing Landholders and Community groups of smaller creek catchments (i.e. Theresa Creek, Sandhurst Creek, Christmas Creek) together to develop and implement tools for the future protection of natural resources in that area (Neighbourhood catchment.)

These Neighbourhood Catchment areas will be identified and prioritised for on-ground actions that meet numerous management outcomes.

Action Plan Tables

The actions to address the management action targets and resource condition targets have been broken into four methods for delivery:

Investigation (I) – Investigation is still need on some actions due to there not being enough information to implement the action.

Benchmarking and monitoring (B&M) – Identify current standard and develop monitoring tools and processes for the measuring against the current standard.

Education and awareness (E&A) – These actions will be implemented through educational information and increasing the awareness of knowledge relating to the action.

On-ground (OG) – These are action that address targets by on-ground works

Many of the timeframes for the implementation of the plan are specific for a finishing date. Funding availability and other factors will impact on the starting date and also the completion date. This will be taken into account when reporting on the implementation of the plan.



Central Highlands Natural Resource Management Plan



Regional Strategy	Management plan	Linkages	Resource Condition	Priority
1. Land use and Management	1.1 Grazing land management	Water quality, river health, soil salinity management, biodiversity	R 1 Retain a minimum of 30% surface cover on Grazing Land in the catchment by 2013 taking into account prevailing seasonal conditions such as drought, flood, fire.	High
	1.2 Dryland cropping management	Water quality, river health, soil salinity	R 2 Retain a minimum of 30% surface cover on paddocks throughout the year in 50% of the catchment by 2008, subject to current best management practices and harvesting, stubble mulching. R 3 Retain a minimum of 30% surface cover on paddocks throughout the year in the remaining 50% of the catchment by 2013, subject to current best management practices and harvesting, stubble mulching.	High
	1.3 Irrigated land management	Water quality, river health, soil salinity	R 4 Retain a minimum of 30% surface cover on irrigated land and/or incorporate the use of alternate management strategies that achieve the same outcome in 60% of irrigated blocks by 2013, taking into account prevailing seasonal conditions such as drought, flood, fire. R 5 Maintain the value of the Fairbairn Dam through maintenance and water quality monitoring.	High
	1.4 Forest land management	Water quality, river health, biodiversity	R 6 Retain a minimum of 30% surface cover through out the year by 2013 R 7 Extent of private forest production lands increased by 10% by 2013	Medium
	1.5 Mining land management	Biodiversity, river health, soil salinity, water quality	R 8 No off site impacts on natural resources caused by mining	Medium
	1.6 Conservation and recreational land management	Biodiversity, land management	R 9 Retain a minimum of 30% surface cover throughout the year on all conservation and recreation land by 2013	High
	1.7 Urban and Infrastructure land management	Biodiversity, water quality	R 10-Local Government to incorporate NRM targets when implementing Planning Schemes.	High
	1.8 Soil salinity management	Biodiversity, water quality	R 11 Maintain and restore levels of deep drainage in cropping and pastoral areas so that salinity risk is not increased within the Comet, Nogoia and Theresa catchments by 2013 R 12 Maintain or restore normal deep drainage amounts so that stock and domestic water supplies are maintained	High
2. Biodiversity	2.1 Aquatic species diversity management	River Health, biodiversity	R 13 Minimise the impacts of artificial barriers in-stream by 2013 R 14 Improve fish passage through artificial barriers on larger streams/rivers by 10% by 2013 specifically in the Nogoia catchment	Low
	2.2 Land biodiversity	River health, grazing, mining, forestry, cultural heritage	R 15 Comply with Regional Vegetation Management Plans	High
	2.3 Threatened species and communities	Biodiversity	R 16 Maintain or improve the conservation status and geographic distribution of aquatic species listed as rare, vulnerable or endangered by 2013	Medium/ High



Central Highlands Natural Resource Management Plan



				<p>R 17 Minimise further loss of biodiversity by ensuring the protection individual species</p> <p>R 18 Maintain conservation status of terrestrial species</p>	
	2.4 Pest plants and animals	Land management, biodiversity		<p>R 19 Contain and reduce the impact of pest plants and animals at a catchment level in a coordinated approach by 2013</p> <p>R 20 The impact of weeds (class 2) is stabilised in strategic areas by 2013</p> <p>R 21 No outbreaks or establishment of new plant and animal pests beyond the regions capability for eradication within the Comet and Nogoa catchment.</p>	Very high
3. River health and water quality	3.1 River health	Water quality, Biodiversity		<p>R 22 Improve the condition or area of 20% of 'of concern' riparian areas by 2013</p> <p>R 23 Retain current habitat variability and condition of riparian reaches with high ecological value in Comet, Nogoa and Theresa Creeks</p> <p>R 24 Fragmentation of key wildlife corridors, particularly riparian areas, is reduced by regenerating 1,500ha of wildlife habitat by 2013</p>	High High Medium
	3.2 Wetland management	Biodiversity, water quality		<p>R 25 Improve natural wetland values while still maintaining their function and viability by 2013</p>	Medium
	3.3 Water quality	River health, biodiversity		<p>R 26 Develop water quality reference sites and guidelines appropriate for the Central Highlands region by 2013</p> <p>R 27 Maintain and reduce current EC levels in aquatic ecosystems</p> <p>R 28 Maintain recharge levels in groundwater</p>	Very high Low
4. Cultural heritage	4.1 Cultural Heritage Management	Social and economic viability, biodiversity		<p>R 29 Aboriginal control over indigenous cultural heritage (places, sites, artefacts, intellectual theft) by 2013</p> <p>R 30 No land management, planning or development impacts (eg. Clearing, dams, weirs) in culturally sensitive areas by 2013</p> <p>R 31 Proactive regional planning that avoids location of development in culturally sensitive areas</p> <p>R 32 Reduce 'social' impacts on culturally sensitive areas (eg. Theft, loss of knowledge, low awareness or understanding) by 2013</p>	Medium
5. Sustainable communities	5.1 Social viability	Economic viability		<p>R 33 Harness the knowledge and power in the local community</p> <p>R 34 Flexibility in the Targets to allow for new knowledge and improved management of Natural Resources</p>	High
	5.2 Economic viability	Social viability		<p>R 35 Maintain the economic viability of the region</p>	Medium
	5.3 Capacity building	Land management, social viability		<p>R 36 Increase the skills and knowledge of the community in the region by 20% in relation to their understanding and ability to address natural resource management issues by 2013</p>	High
6. Regional Coordination	6.1 Regional Management	All management actions		<p>R 37 Review Plan every 5 years to track progress and ensure it is a living and relevant document</p>	Very high



1. Land Use and Management

Aspirational Target

By 2050, management of the region's land resources (soil and vegetation) is ecologically, socially and economically sustainable and able to support a range of diverse uses.

The Central Highlands supports a diverse range of industries such as grazing, cropping, irrigation and mining, as well as community services through urban recreation and conservation lands.

Productive agricultural land is one of the main assets identified in the plan and needs to be protected. Ground cover plays an important part in providing protection of soil and reducing the loss of soil from paddocks.

The Central Highlands experiences many conditions that are conducive to soil erosion. These include the rainfall intensity, the erodibility of the soil and the slope of the land surface.¹⁵ Rates of soil erosion are reduced when management practices retain cover on the surface and protect the bare soil from exposure to direct raindrop impact.

Property management planning is a good management tool for the protection of our natural resources providing for the management of natural resources at a property level. Improved pastures have provided the region with a reliable source of fodder.

Many of the targets addressing soil condition are designed to reduce runoff and soil erosion across grazing, dryland cropping and irrigation land. This can be controlled by greater ground cover.

Variability in both climate and biophysical conditions over both space and time influences the pattern of land use and its potential for change. In particular climatic variability has led to periodic periods of prolonged drought across the region. Many of the targets take into account variable seasons, which include fire, flood and drought.

Limitations on water availability also impacts directly on opportunities for the further development and expansion of intensive agriculture in the region.

Current Information Gaps

There is a need to understand how different management practices impact on different soil types – statistics and data on sustainable indicators are not available at a property level, i.e. rainfall, paddock production and ground cover.

¹⁵ Understanding and managing soils in the Central Highlands – Resource Information



1.1 Grazing Land

Grazing land occurs throughout all land resource areas and is the predominant land use, covering 82% of the catchment. The distribution of grazed land throughout the Central Highlands is shown in Figure 4.

30% surface cover is now accepted as the minimum amount required to manage soil erosion. The higher the amount of surface cover the less likely it is that soil will be eroded into gullies and streams. Productive pasture provides for the economic viability of the Central Highlands

The Resource Condition of 30% surface cover refers to 'prevailing seasonal conditions'. Prevailing seasonal conditions takes into account prolonged drought, floods and fire. The 30% ground cover outlined in this plan should be representative of the majority of the paddocks, if monitoring and reporting at the paddock level. Some areas in a paddock will have minimal cover such as cattle troughs and camps.

Grazing land management workshops are currently being developed by the DPI. These address strategies to increase profit and sustainability. There are seven modules, which provide the basis of a grazing management plan. The DPI is also developing 'Stocktake', a monitoring package that takes stock of the grazing resources on a property and points to improved management decisions.

Sustainable Grazing Systems will provide the opportunity for some landholders to showcase how they manage their natural resources.



Figure 10. 30% ground cover on grazing land – cover can include leaf litter, sticks, pasture and manure.

Photo courtesy of Paul Jones, Department of Primary Industry



Central Highlands Natural Resource Management Plan



1.1. Grazing Land Management

Resource Condition Target	R 1- Retain a minimum of 30% surface cover on Grazing land in the catchment by 2013 taking into account prevailing seasonal conditions such as drought, flood, fire.							
Management Action Targets	Method	Actions	Links	Outcomes	Time Frame	Priority	Geographic Focus	Implementation Responsibility
M 1- 50% of landholders in the catchment to have Property Management Plans according to the requirements of the individual property manager and ensure that the plans can be accredited by industry standard- June 2008	I	1.1 Develop and understand different management plans/options for different soil types	R 2, 4, 6, 9	Understanding of BMP on different soil types	June 2006	High	All LRAs	DPI, DNR&M FBA, CHRRUP
	B&M	1.2 Use community consultation and input for the development of a comprehensive monitoring and evaluation framework for pasture management (eg. Stocktake program).		Appropriate monitoring program developed	June 2004	High	Regional	CHRRUP, FBA, DPI, grazing industry sector,
	B&M	1.3 Continue Property Management Plan monitoring and reporting at a property level.	M 3.3	Increased property management plan implementation	On-going	Medium	Regional	FBA, DPI, grazing industry CHRRUP
	E&A	1.4 Define and promote Property Management Plans throughout the Comet and Nogoa/Theresa Catchment	M 3.2	Increased property management plan implementation	On-going	High	Regional	CHRRUP, FBA, State agencies, industry sector
M 2- Define and Promote Sustainable Grazing Systems to 50% of Landholders in Comet and Nogoa/Theresa Catchment, to be developed in conjunction with the Priority Action Projects by 2013	OG	2.1 10% of landholders (representative of various grazing systems and land types) to define and implement Sustainable Grazing Systems by June 2007		Adoption of best management practice for grazing land management	2007	Medium	Regional	DPI
	I	2.2 Establish what type of biodiversity maintenance is realistic within a Sustainable Grazing Systems by June 2007	M 19.3	Increased biodiversity	2006	Medium	Grazing Land	DPI, DNR&M
	B&M	2.3 Develop an open and transparent system and database that collates and summarises information on sustainable indicators at the paddock and property level by June 2008.	M 3.1	Indicators that will guide management decisions	June 2008	Low	Rolleston, Springsure Regional	DPI, FBA, industry sector, NR&M, CHRRUP



1.2 Dryland Cropping

Dryland cropping occurs predominantly on the undulating downs and alluvial plains (Figure 4) in the northeast of the catchment. Farmers in the catchment are highly progressive, with around 70% using minimal and zero tillage, in place of conventional cropping. Zero tillage improves soil health and reduces energy input.¹⁶

Sustainable Cropping Systems provides for high ground cover and would become part of a property management plan for cropping areas. High ground cover increases infiltration and crop production, and reduces runoff and erosion.

It is envisaged that monitoring and reporting of ground cover would be undertaken at a property scale within the guidelines of a Property Management Plan.

30% surface cover is also accepted as the minimum amount of cover to reduce soil erosion and is explained further in 1.1 above (Grazing Land Management).

The use of chemicals in dryland farming impacts predominantly on water quality, and is addressed in Part 3.3



Figure 11. Sunflowers – a popular crop in the region

Photo courtesy of CHRRUP



Figure12. 30% ground cover on cropping land

Photo courtesy of Department of Primary Industry

¹⁶ Central Queensland Information Paper: Vol.1



1.2 Dryland Cropping Management

Resource Condition Target	<p>R 2 Retain a minimum of 30% surface cover on paddocks through out the year in 50% of the catchment by 2008, subject to current management practices and harvesting, stubble mulching etc.</p> <p>R 3 Retain a minimum of 30% surface cover on paddocks through out the year in the remaining 50% of the catchment by 2013, subject to current management practices and harvesting, stubble mulching.</p>
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Management Action Targets	Method	Actions	Links	Outcomes	Time Frame	Priority	Geographic Focus	Implementation Responsibility
M 3 Implement Sustainable Cropping Systems in 50% of cropping areas by 2008	B&M	3.1 Develop an open and transparent system and database that collates and summarises information on sustainable indicators at the paddock and property level by June 2008.	M 2.3	Indicators that will guide management decisions	June 2008	Low	Rolleston, Springsure Regional	DPI, FBA, industry sector, NR&M, CHRRUP
	B&M	3.2 Monitor the adoption rate of property management plans through out the region by 2008	M 1.4	Increased property management plan implementation	2008	Medium	Regional	FBA, CHRRUP, DPI, industry sector
	B&M	3.3 Monitoring of surface cover done by property owners at a paddock level through the development and implementation of Property Management Plans.	M 1.3	Reduction in soil loss	On-going	Medium	Regional	Land managers, DPI, DNR&M
	E&A	3.4 Define and promote Sustainable Cropping Systems as part of property management plans in 50% of cropping areas by 2008 in the Central Highlands		Increased property management plan implementation	2008	High	Rolleston, Springsure, Capella	DPI, NR&M, industry sector, CHRRUP, FBA
M 4 Implementation of Sustainable Cropping Systems for the remaining 50% of cropping areas by 2013	E&A	4.1 Promote the implementation of Sustainable Cropping Systems to the remaining 50% of cropping areas		Reduction in soil erosion	Ongoing	High	Regional	DPI, FBA, NR&M, industry sector, CHRRUP
	E&A	4.2 Continue to develop and promote Sustainable Cropping Systems within the Central Highlands as more information and technology is developed		Increase awareness and implementation of best management practice	On-going	Medium	Regional	DPI, FBA, NR&M, industry sector, CHRRUP



1.3 Irrigated Land

The Fairbairn Dam is an important asset that provides for productive irrigated land in the region. The Fairbairn Dam provides water for cotton, horticulture and other irrigated crops. These industries rely on the dam for reliable irrigation water.

The dam is recognised as a significant wetland.¹⁷ Fairbairn Dam is an important dry season refuge for waterbirds and is a significant, large, permanent water body in central Queensland. Although artificial it provides the equivalent of a natural lake and swamp habitat.

30% surface cover is again the prescribed resource condition to reduce soil erosion and is explained further in 1.1 above (Grazing Land Management). Seasonal conditions can adversely impact on the type and amount of ground cover, causing reduced ground cover between plantings. Alternative management practices may include:

- permanent beds
- tail water reticulation and collection sumps
- laser levelling
- minimum till
- moisture preservation cultivation practices
- water use efficiency practices such as better irrigation scheduling.

Monitoring of land cover is best done at the paddock scale by the property manager.

As described above, cotton industry BMPs are a voluntary management plan and assist in providing direction for best management practice. References in this section to property management planning may mean adherence to cotton industry BMPs for many irrigators.



Figure 13. Irrigated cotton near Emerald

Photo courtesy of CHRRUP



Figure 14. 30-40% cotton mulch cover

Photo courtesy of David Kelly, Dept. Primary Industries

¹⁷ A Directory of Important Wetlands in Australia



1.3 Irrigated Land Management

Resource Condition Target	<p>R 4 Retain a minimum of 30% surface cover on irrigated land and/or incorporate the use of alternate management strategies that achieve the same outcome in 60% of irrigated blocks across the catchment by 2013, taking into account prevailing seasonal conditions such as drought, flood, fire.</p> <p>R 5 Maintain the value of the Fairbairn Dam through maintenance and water quality monitoring.</p>
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Management Action Targets	Method	Actions	Links	Outcomes	Time Frame	Priority	Geographic Focus	Implementation Responsibility
<p>M 5 Promote the uptake of Property Management Plans through out the Central Highlands by 2013</p> <p>Eg. EMS, Cotton Industry BMP, and or other suitable accredited industry Code of Practice</p>	B&M	5.1 Yearly field maintenance on 100% of irrigated Lands carried out at the property level.		Reduction in soil erosion	On-going	Medium	Irrigation areas in the Nogoog and Comet regions	Land managers, State agencies
	I	5.2 Define Sustainable Irrigation Systems (SIS) for Cotton, Lucerne, Horticulture, Citrus, Grapes, vegetables in association with Priority Action Projects by 2004		Increase awareness and implementation of best management practice for irrigation systems	June 2004	High	Irrigation areas in the Nogoog and Comet regions	DPI, FBA, Fitzroy F&FA, Cotton Australia, NR&M, CHRRUP
	E&A	5.3 Continue to develop and promote Best Management Practices suitable for different crop and soil types		Increased awareness of different crop and soil requirements	On-going	Medium	Regional	Cotton Australia, DPI, NR&M,
	I	5.4 Define Best Management Practices for levee banks and grass filters by 2008		Reduction in soil erosion	2008	Low	Regional	Cotton Australia, DPI, NR&M,
<p>M 6 Maintain the integrity of the Fairbairn Dam</p>	B&M	6.1 Water monitoring of the Fairbairn Dam to be undertaken on a regular basis	M 33 & 35	Maintain good irrigation water	On-going	High	Fairbairn Dam	Sunwater
	B&M	6.2 Water monitoring of irrigation channels to be undertaken on a regular basis	M 33 & 35	Maintain good irrigation water	On-going	High	Emerald Irrigation Area	Sunwater, IAWM



1.4 Forest Land

There are 221 000 ha of State Forest and Timber Reserves in the Central Highlands. The Queensland Parks and Wildlife Service manages State Forests and Timber Reserves. These are all native eucalypt forests and the management of forestland is important in reducing soil erosion.

1.4 Forest Land Management

Resource Condition Target	<p>R 6 Retain a minimum of 30% surface cover through out the year by 2013</p> <p>R 7 Extent of private forest production lands increased by 10% by 2013</p>
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Management Action Targets	Method	Actions	Links	Outcomes	Time Frame	Priority	Geographic Focus	Implementation Responsibility
<p>M 7 Promote the management of Forest Lands for sustainable timber production or for biodiversity conservation, relevant to tenure, in 50% of Forest Land-June 2008</p> <p>Encourage and promote for remaining 50%- by 2013</p>	B&M	<p>7.1 Monitor levels of ground cover in State and private forest lands.</p>		Reduction in soil erosion	On-going	Low	Regional	DPI, NR&M
	E&A	<p>7.2 Continue to define and promote Sustainable Timber Management systems in forest lands</p>	M 20.2	Best management practice for timber management systems defined	On-going	Medium	Regional	FBA, industry sector, DPI
	OG	<p>7.3 Seek adoption of suitable grazing systems in all State Forests and Reserves by undertaking catchment-wide reviews of lease and permit conditions and monitoring programs in conjunction with relevant government agencies by 2006.</p>		Implementation of best practice grazing systems in State forests and reserves	June 2006	Medium	Regional	DPI, NR&M



1.5 Mining Land

The mining industry has the highest value of production for land use in the Central Highlands. Mining is important to the economy of the region, with mine rehabilitation being essential to the environment. It will prevent surface crusting, increase filtration and hence successful establishment of vegetation regrowth. EMOS apply to both old and new mining sites.

Mining companies have Environmental Management Overview Strategy (EMOS) that prescribe best management practice for mine rehabilitation. EMOSs should reflect community aspirations for the management of our natural resources. Rehabilitation of mines sites is vitally important as areas can have very steep gradients and are quite susceptible to erosion.

1.3 Mining Land Management

Resource Condition Target	R 8 No off site impacts on natural resources caused by mining							
Management Action Targets	Method	Actions	Links	Outcomes	Time Frame	Priority	Geographic Focus	Implementation Responsibility
M 8 Mining companies continue to rehabilitate mining land in accordance with Environmental Management Overview Strategies (EMOS) for each mine	B&M	8.1 Monitor the implementation of Environmental Management Overview Strategies (EMOS) for land rehabilitation.		Protection of the biodiversity values of the peripheral areas within the mining leases that are not subject to mining.	On-going	High	Kestrel Coal, Blair Athol, Blackwater, Gregory Crinum	Mining sector, EPA, FBA, DNR&M
M 9 Define, promote and use best management practice in rehabilitation methods in line with regional NRM Plans	B&M	8.2 100% compliance with EMOS, and public reporting of compliance, throughout life of mine including commissioning, rehabilitation, decommissioning and handback		Increased offsets to mining of significant biodiversity areas.	On-going	Medium	Kestrel Coal, Blair Athol, Blackwater, Gregory Crinum	Mining sector, EPA, FBA, DNR&M



1.6 Conservation and Recreational land

National Parks and reserves help to preserve a proportion of regional biodiversity. However these areas do face threats with introduced species and the lack of resources to manage them appropriately. Many of the parks and reserves are fragmented, which means that without coordinated action

to enhance biodiversity through greater habitat connectivity and integrated pest management, the biodiversity is at risk.

Fire regimes are designed to protect and maintain woodland structure, and are promoted in the regional vegetation management plans (RVMP).

1.3 Conservation and Recreational Land Management

Resource Condition Target	R 9 Retain a minimum of 30% surface cover throughout the year on all conservation and recreation land by 2013
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Management Action Targets	Method	Actions	Links	Outcomes	Time Frame	Priority	Geographic Focus	Implementation Responsibility
M 10 All National Parks have a local action plan developed in conjunction with local communities.	I	10.1 Investigate impacts of conservation land on surrounding lands and on public access		Understand the impact of conservation management on surrounding land.	2006	High	Parks	EPA (National Parks and Wildlife services)
	I	10.2 Investigate impacts of surrounding land and public access on conservation land		Understand the impact of surrounding land management on conservation land	2006	High	Parks	EPA (National Parks and Wildlife services)
	OG	10.3 Promote the use of different burn regimes in Conservation areas - Aboriginal people to be involved in fire management of Conservation areas		Increased biodiversity in conservation and recreational land	On - going	Medium	Regional	EPA, Aboriginal communities
M 11 Maintain conservation and recreational land in good condition.	E&A	11.1 Promote the uptake of best management practice in Conservation and Recreation Land		Increased biodiversity in conservation and recreational land	On - going	Medium	Regional	EPA (National Parks and Wildlife), Local Government, community



1.7 Urban and Infrastructure Land Management

The Integrated Planning Act 1997 establishes a uniform system for making, assessing and deciding development applications. Local Government Authorities are required to complete planning schemes under the Act by June 2004. The Integrated Planning Act 1997 deals only with new development and many of the environmental outcomes, in the new planning schemes, will be determined by the availability and credibility and usefulness of State Agency data.

The schemes indicate the location and nature of future major infrastructure, and prescribe areas or places that constrain the use of land due to their environmental value or their adverse effects on development.

Measures to understand and control point and non-point sources of pollution and urban stormwater design need to be taken into consideration when developing the planning schemes.

Local Governments within the Central Highlands include Peak Downs, Emerald, Bauhinia, Jericho and Belyando. There is already a strong partnership between these shires, demonstrated by the formation of the CHRRUP, as a regional planning body across the five shires and CHDC, for economic planning. CHNRMG, for pest management was also established.

Impacts on the natural environment and the use of resources by urban communities differ from those of rural communities. Larger populations of people in urban areas produce significant amounts of waste and use a lot of resources. The impacts of urban areas are not confined to a town or city.

Many of the assets identified in the Plan relate to the viability and security of urban areas.



1.7 Urban and Infrastructure Land Management

Resource Condition Target		R 10 Local Government to incorporate NRM targets when implementing Planning Schemes							
Management Action Targets	Method	Actions	Links	Outcomes	Time Frame	Priority	Geographic Focus	Implementation Responsibility	
M 12 Encourage a reduction in amount of pesticides and fertiliser applied in urban and town areas by 2008, and reduce other overuse of substances and contaminants that impact on bio diversity by 2008	I	12.1 Investigate current pesticide and fertiliser use in urban and town areas by 2006		Greater understanding of impact of pesticides and fertiliser	2006	Medium	Urban Areas	Local Government, CHRRUP, EPA	
	OG	12.2 Each Local council to develop local laws for pesticides and fertilizer by 2008		Reduction in pesticides entering waterways	2008	Medium	Urban Areas	Local Government, Community, EPA	
	OG	12.3 All local councils continue to develop point source pollution/sewage overflow abatement plans.		Appropriate plans developed	On-going	Medium	Urban Areas	Local Government FBA, CHRRUP	
	E&A	12.4 Encourage and promote the use of rainwater tanks and the recycling of grey water in urban and town areas		Greater self sufficiency and reduced burden on town water supply	On-going	Medium	Urban Areas	Local Government FBA, CHRRUP	
	E&A	12.5 Increase awareness of best practice use of fertilisers and pesticides in urban areas.	M 33.7	Reduction in nutrients entering waterways	On-going	Medium	Urban Areas	Local Government FBA, CHRRUP	
	E&A	12.6 Increase the understanding of stormwater and the impacts of litter on local waterways eg. Drain stencilling		Reduction of litter in waterways	On-going	High	Urban Areas	Local Government FBA, CHRRUP, Waterwatch	
	E&A	12.7 Promote the management of stormwater and waste water in shires		More responsible water use in shires	On-going	Medium	Urban areas	Local Government FBA, CHRRUP, Waterwatch	



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<p>M 13 Ensure that new development is inline with sound Natural Resource Management and the IPA</p>	E&A	<p>12.8 Develop educational material to increase the urban communities recognition that they and their town are part of the catchment by 2006</p>	M 48	Increased awareness and more responsible water use in urban areas	2006	Very high	Urban areas	FBA, Waterwatch, Local Government, CHRRUP
	OG	<p>13.1 Local Government to target outcomes for urban areas in operational plans and local laws</p>			2006	High	Urban Areas	Local Government Community, EPA
	OG	<p>13.2 Develop a co-operative, integrated approach to urban planning within and between shires</p>		Greater coordination	2009	High	Urban Areas	Local Governments Community, EPA, private sector
	OG	<p>13.3 Develop a regional approach to sustainable waste management including waste minimisation and recycling options</p>		Appropriate, coordinated, sustainable waste management approach in place	2006	High	Urban areas	Local Government, EPA, private sector
	OG	<p>13.4 Improve the management and status of riparian corridors and other remnant vegetation associated with urban land uses</p>	M 19.2 M 29.2 M 28.2	Increased aquatic biodiversity	On-going	High	Urban areas	FBA, Local Government, EPA, community
	E&A	<p>13.5 Promote sustainable water use in urban areas</p>	M 35.1	More responsible water use in urban areas	On-going	High	Urban areas	Local Government FBA, CHRRUP, Waterwatch
	E&A	<p>13.6 Education on promotion of whitefly management by 2004</p>	M 25.5	Sensible use of pesticides	2004		Regional	Cotton Australia CHRRUP



1.8 Soil Salinity

A salinity hazard map has been developed for the region, which provides an indication of the inherent potential for salinity to occur. The analysis considers groundwater flow systems, areas of recharge and areas of discharge.

Managing for salinity is becoming a high priority in the Central Highlands. Salinity is not a major threat as yet, but many of the soils in the area are quite saline. There is the potential for salinity to impact adversely on the economy if people are not aware of the causes and effects. Salinity of groundwater can have a significant impact on productivity in pastoral areas.

Research studies have been conducted looking at engineering strategies to reduce salinity problems.

Soil testing has been completed over time by and is available through the Department of Natural Resources and Mines. Comprehensive soil testing information may also be available through mines operating in the region, however there is no comprehensive data at this stage.

As there is not a real threat of salinity in the region to date, the resource condition targets proposed to maintain the current situation.

More research is needed to develop a more comprehensive resource condition target. This will include:

- Better mapping of ground flow systems;
- Understanding current deep drainage levels;
- Identifying current areas of concern and salinity 'hot spots'.



1.8 Soil Salinity Management

Resource Condition Target	<p>R 11 Maintain and restore levels of deep drainage in cropping and pastoral areas so that salinity risk is not increased within the Comet, Nogoia and Theresa catchments by 2013</p> <p>R 12 Maintain or restore normal deep drainage amounts so that stock and domestic water supplies are maintained</p>
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Management Action Targets	Method	Actions	Links	Outcomes	Time Frame	Priority	Geographic Focus	Implementation Responsibility
M 14 Implement Sustainable Production Systems on 75 properties and 7 Neighbourhood Catchments including examples of all Land Assets through the Priority Action Projects. Include at least one Neighbourhood Catchment specifically for salinity management	B&M	<p>14.1 Link Management Actions to the State-wide Investment Program. This is aimed at:</p> <ul style="list-style-type: none"> - better understanding groundwater systems, salinity processes, risk assessment - modelling of salinity and water quality interactions - developing a monitoring and evaluation framework - salinity assessment in representative catchments (i.e. Neighbourhood Catchments) - evaluating applicability of approaches annually - reporting to community and to recommend refinements 		Management Actions reflect best practice	2004	High	Brigalow plains near Rolleston, Emerald irrigation area	NR&M
	I	<p>14.2 Identify current areas with salinity concern and promote prevention and understanding of how salinity may occur in recharge areas. This may include engineering strategies.</p>		Improvement in some key areas of salinity concern	On-going	High	Brigalow plains near Rolleston, Emerald irrigation area	NR&M
	I	<p>14.3 Measure deep drainage amounts within catchment</p>	M 34.2	Improved understanding of deep drainage and salinity levels	On-going	Med	Emerald irrigation area	NR&M, IAWM



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	B&M	14.4 Develop Sustainable Productions Systems for each industry through the Priority Action Projects by 2008. Ensure Sustainable Production Systems target deep drainage and ground water management at both property scale and regional-scale	Systems appropriate for each industry and property developed	2008	High	Regional	DPI, FBA, NR&M and land managers
M 15 Support industry-led self-management programs and others such as the Rural Use Efficiency Initiative, which promote water use efficiency and best management practice.	E&A	14.5 Create a greater understanding of salinity at a property and urban level causes and effects	Greater understanding of salinity	2006	High	Regional	NR&M
	OG	14.6 Reduce irrigation water losses from open distribution channels	Reduce the potential of rising water tables	2006	High	Emerald Irrigation Area	Sunwater, IAWM
	E&A	15.1 Create an understanding of groundwater and natural salinity levels within the catchment, and increase awareness of tree management for salinity	Greater understanding of salinity	On-going	High	Regional	NR&M
	OG	15.2 Salinity to be taken into account when developing Property Management Plans for various land assets	Greater consideration of salinity in property management	On-going	High	Regional	FBA NR&M and land managers
	I	15.3 Identify land areas that require rehabilitation (e.g. planting of deeprooted trees to restore natural water balance) and / or protection to alleviate any future salinity problems by 2006 (link to Salinity Management Actions)	Key areas identified to manage salinity	2005	Medium	Rolleston and Emerald	DNR&M, Land Managers



2. Biodiversity

Aspirational Target

By 2050, a comprehensive and representative range of healthy regional ecosystems is conserved both on and off reserves, with a connected network of native vegetation remnants, riparian zones and wetlands

The biodiversity of a region is described as the number and variety of organisms found within a specified region.

The Central Highlands retains most of its natural values, despite the extensive land clearing of native vegetation for pasture production and cropping. Maintaining biodiversity is a whole of community responsibility.

The loss and degradation of wildlife habitat associated with broadscale clearing is the main loss of biodiversity in the catchment. In the alluvial and clay downs there is now a high degree of fragmentation of remnant vegetation. The extent of future clearing will be limited through a range of strategies, specifically the regional vegetation management plans.¹⁸

The main issues for the maintenance of the key terrestrial biodiversity assets of the catchment are:

- The implementation of grazing land management practices that restore and maintain ground cover in remnant vegetation
- Restoration of cleared areas to reduce the fragmentation of critical ecosystems and improve connectivity in riparian areas
- Control of invasive species where these represent a threat to biodiversity and conservation of remnant vegetation



Figure 15. Eucalypt leaf

Photo courtesy of Department of Natural Resources and Mines

¹⁸ Draft Regional Vegetation Management Plans, Department of Natural Resources and Mines



2.1 Aquatic Biodiversity

In both the Comet and Nogoia River there are long stretches of uninterrupted river flow, which are especially important for their biodiversity value. However, there are a series of artificial barriers found in these rivers. Which reduces the migratory movement of fish species throughout the catchment.

The major influence on the aquatic biodiversity of the region's rivers is the Fairbairn Dam, (mainly affecting the aquatic ecosystem of the Nogoia River). There are also a number of weirs associated with the Emerald Irrigation Area. There has been a large reduction in shallow flowing water habitat below the Fairbairn Dam, and the weirs and dam are likely to prevent the passage of fish and other fauna in these reaches.

The EPA has developed best management practice guidelines for the installation of stream barriers on major rivers.

Fish kills have been reported in the Fairbairn Dam but there is not enough information outlining the cause of the kill. This may have been associated with natural processes such as low dissolved oxygen associated with low water levels in summer. There needs to be a more comprehensive reporting mechanism to understand why there are occasional fish kills in the Fairbairn Dam.

Riparian zones provide in-stream habitat such as snags and shade, food sources, and a reduction in the erosion of streambeds. Connectivity of many riparian areas is fractured, reducing in-stream habitat.

There is evidence that the community recognises these pressures on these habitats and management regimes are being developed which may assist in maintaining biodiversity.



2.1 Aquatic Species Diversity Management

Resource Condition Target	R 13 Minimise the impacts of artificial barriers in stream by 2013 R 14 Improve fish passage through artificial barriers on larger streams/rivers by 10% by 2013 specifically in the Nogoa catchment									
Management Action Targets	Method	Actions	Links	Outcomes	Time Frame	Priority	Geographic Focus	Implementation Responsibility		
M 16 Provide appropriate freshwater flows to maintain inland systems as per Fitzroy Resource Operation Plan (ROP) by 2013	OG	16.1 Release of environmental flows, including base flows, in line with Water Resource Plan requirements		Water Resource Plan requirements are being met by the community	2013	Medium	Major streams	NR&M, SunWater		
	I	16.2 Provide the opportunity for more study into Environmental Flows.		Increased knowledge of environmental flows	2008	High	Major streams	NR&M, FBA		
M 17 Improving water chemistry to levels proposed in Water Quality condition targets	E&A	17.1 Education and awareness of stream biodiversity using existing programs eg. Waterwatch	M 30.1	Increased awareness of benefits and maintenance of stream biodiversity	On-going	High	Regional	Waterwatch, Community		
	B&M	17.2 Monitor and record aquatic biota kills and aim to maintain low incidence of kills in the Comet, Theresa and Nogoa Catchments		Greater understanding of causes of fish kills	On-going	Medium	Regional	EPA		
	OG	17.3 Provide for off-site watering points through the devolved grant project	M 28.4	Reduction in stream bank erosion	On-going	Medium	Regional	FBA		
	I	17.4 Develop a structure/process for reducing fish kills in Hoods Lagoon, Clermont.		Process in place to reduce fish kills	2006	Low	Clermont	EPA, Local Government, NR&M		



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M 18 Install fishways where practicable by 2011	OG	18.1 Ensure new barriers include fish passages and use best practice design and construction.		Freshwater flows being provided in accordance with ROP	On-going	Low	Major streams	NR&M , Local Government, Land Managers
	E&A	18.2 Educate local community on the impacts of stream barriers.		Increased understanding of impact of stream barriers	On-going	Low	Regional	EPA , NR&M , CHRRUP , FBA , Local Government
	I	18.3 Identify and prioritise artificial barriers to migration at the neighbourhood catchment scale by 2006		Artificial barriers to migration identified	2006	High	Major streams	NR&M , EPA , Land Managers
	OG	18.4 Reengineer stream crossings, levees etc. to cater for movement of aquatic species where practicable		Increase aquatic biodiversity	On-going	Low	Major streams	Local Government , EPA , NR&M , Land Managers
	OG	18.5 Improved management of water infrastructure (irrigation channels, dams and weirs) by 2008		Environmental impact of water infrastructure reduced	2008	Medium	Regional	Local Government , Sunwater , EPA , NR&M



2.2 Biodiversity on Land

The Comet and Nogoja Catchments retain much of their natural values despite the extensive clearing of native vegetation for pasture production and cropping.

Many of the Land Biodiversity Management Actions include the protection of native species in the region, through the connectivity of vegetation corridors and increased ground cover. Many species have declined in numbers due to a reduction in vegetation and changes in land management.

The community is committed to maintaining biodiversity and recognises its importance but many of the actions agreed to by the community are dependent on the Plan remaining voluntary. With the amount of legislation at the moment, impacting on primary production many producers found it difficult to agree to targets for the region. There was a feeling that anything they agreed to would in future work against them in the everyday management of natural resources. Greater partnerships need to be developed between industry, including mining, and the community to ensure community expectations for biodiversity protection are met.

The resource condition target refers to compliance with regional Vegetation Management Plans. These plans will prescribe the following guidelines:

- Retain a minimum 40% of native vegetation coverage to maintain ecological processes and ecosystems within the catchment in line with Regional Vegetation Management Plans
- No loss of each Regional Ecosystem with an “endangered” biodiversity status
- No net loss of regional ecosystems with an “of concern” biodiversity status

- State significant remnant vegetation protected from habitat loss
- In 20% of the catchment, conserve the integrity of the ecosystem, where loss of ground cover threatens biodiversity conservation

During the development of the Regional RVMPs there was extensive community input into the above guidelines.

A voluntary solution:

Landholders are encouraged to allow areas of vegetation to regenerate in critical areas where it will improve landscape linkages.



Figure 16. Coolibah

Photo courtesy of Department of Natural Resources and Mines



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2.2 Biodiversity on Land

Resource Condition Target		R 15 Comply with Regional Vegetation Management Plans									
Management Action Target	Method	Actions	Links	Outcomes	Time Frame	Priority	Geographic Focus	Implementation Responsibility			
<p>M 19 Adequately represent the diversity and richness of the region's wildlife by protecting 15,000ha of remnant vegetation from clearing (through voluntary acquisition of land for protection areas, or through voluntary covenants with landholders) by 2010</p>	OG	19.1 Implement realistic incentive programs for biodiversity conservation and vegetation management by 2006		Increased biodiversity	2006	Medium	Regional	State and Federal Governments			
	E&A	19.2 Promote with realistic incentives, the revegetation for critical landscape linkage through natural regeneration on private land only if voluntary and subject to agreement with government		Increased biodiversity without adverse impact on landholders	On-going	Low	Regional	State and Federal Governments			
	OG	19.3 Adopt grazing systems that protect biodiversity and improve economic returns. These systems need to cover the diversity of grazed remnant ecosystems for the catchment by 2004	M 2.2	Appropriate systems developed and adopted	June 2004	High	Regional	DPI, EPA, NR&M, land managers			
	I	19.4 Investigate and develop a database of seed banks for endangered and 'of-concern' species by 2006		Easy access to suppliers	2006	Medium	Regional	FBA			
	E&A	19.5 Encourage and assist landholders to maintain habitat for wildlife under "Land for Wildlife" and other programs by having a coordinated program for the Central Highlands		Increased biodiversity	June 2004	Medium	Regional	CHRRUP, DPI, NR&M, EPA			
	E&A	19.6 Co-ordinate community biodiversity extension activities (including integration with PMPs) focusing on Landholders responsible for areas of significant remnant vegetation by 2004	M 1.4	Protection of biodiversity in significant areas within State	June 2004	High	Regional	CHRRUP, DPI, NR&M, FBA, EPA			
	OG	19.7 Endeavour to improve grazing land management in remnant vegetation by co-ordinating community extension activities through different organisations eg. FarmBis, NR&M	M 2.2	Achieve best practice in grazing land management in remnant vegetation	2008	Medium	Regional	Land managers, EPA, NR&M			
	B&M	19.8 Monitor the condition of state significant vegetation every 2 years based on best available knowledge		Increased tracking of significant vegetation	On-going	High	Regional	EPA			



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M 20 Regenerate non-remnant areas (on State Forest and reserves) under active regeneration programs by 2010	B&M	20.1 Define appropriate areas and methods for the regeneration of endangered and of concern regional ecosystems, including the management of fire, pigs and grazing survey local landholders to gather local information		Increased biodiversity	2006	High	Regional	EPA NR&M, Land Managers
	OG	20.2 Seek adoption of sustainable practices for timber harvesting from remnant vegetation on all lands	M 7.2	Implementation of best practice in harvesting from remnant vegetation	2006	Medium	Forest areas	EPA, NR&M
M 21 Revegetate non-remnant areas (primarily through the management of regrowth) on Mining Land	B&M	21.1 Identify the potential areas of loss of endangered and of concern regional ecosystems due to mining and seek compensatory protection of remnant or regrowth (disturbed) regional ecosystems through agreement by 2006		Awareness of important areas and protection of biodiversity	2006	Medium	Mining areas	EPA, NR&M
	OG	21.2 Negotiate with mining companies with interests in Central Queensland to ensure environmental management plans for mining leases and exploration activities adequately protect endangered regional ecosystems and restore biodiversity values by 2006	M 8.2	Increased involvement by mining companies in protecting biodiversity	2006	High	Mining areas	FBA
M 22 Ensure policy, plans and strategies for biodiversity conservation are reflected in local government planning schemes to the extent that positive outcomes can be practically achieved	B&M	22.1 Develop a catchment wide monitoring system for the ground layer in remnant vegetation by 2006		Increased tracking of ground layer remnant vegetation	2006	Medium	Regional	EPA
	OG	22.2 Make submissions as part of the public comment process for each Regional Vegetation Management Plan in Central Queensland		Contribution to regional plans affecting our region	June 2004	High		CHRRUP



2.3 Threatened Species and Communities

Some parts of the catchment are significant as habitat for rare and threatened plant and animal species, and for other species of conservation status. Species loss is an important focus of community concern.

Site records for threatened species are available but there have not been systematic surveys undertaken. It is understood that native fish species and woodland bird species are in decline.

There are a total of 377 vertebrate species identified in the Central Highlands with 26 species listed under the Queensland Nature Conservation (Wildlife) Regulation 1994.

There are two recovery plans for 'at risk' fauna species. A recovery plan for the Belyando cobblers peg has been drafted for the Nogoia Catchment. The endangered bridled nail tailed wallaby has been released on the Avocet Nature Refuge under the recovery plan for this species.

There is one fish species, the leathery grunter, which is endemic to the Nogoia Catchment. One of the actions identifies the need to understand the habitat and location of the Leathery Grunter ensure that their habitat is not threatened.

There are 48 plant species of conservation concern in the Central Highlands. A number of 'at risk' species are either naturally rare or threatened due to grazing pressures. Bluegrass downs and brigalow communities have been threatened through modifications to remnant vegetation. Weeds such as parthenium are a threat to the integrity of many ecosystems.



Figure 17. Bridled nail-tailed wallaby
Photo courtesy of Environmental Protection Authority



2.3 Threatened Species and Communities

Resource Condition Target	<p>R 16 Maintain or improve the conservation status and geographic distribution of species listed as rare, vulnerable or endangered 2013</p> <p>R 17 Minimise further loss of biodiversity by ensuring the protection individual species</p> <p>R 18 Maintain conservation status of terrestrial species</p>
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Management Action Targets	Method	Actions	Links	Outcomes	Time Frame	Priority	Geographic Focus	Implementation Responsibility
M 23 Maintain habitat requirements for Leathery grunter	I	23.1 Determine locations supporting healthy populations of Leathery grunter in Central Highlands		Leathery grunter numbers protected	2006	Medium	Nogoa and Comet River	EPA
	OG	24.1 Continue to implement the recovery plan for the Bridled Nail Tail Wallaby		Bridled nail tail wallaby protected	On-going	High	Comet Catchment	Community, Local Government
M 24 Attempt to protect animal and plant species with a Common conservation status in order to prevent them from becoming less secure in the catchments	OG	24.2 Continue to implement the recovery plan for the Cobblers Peg		Belyando Cobblers Peg protected	On-going	High	Nogoa Catchment	Community, Local Government
	I	24.3 Develop partnerships with industry for the recovery of species of conservation concern		Increased protection of species of conservation concern	2006	High	Regional	EPA, FBA
	I	24.4 Identify which endangered species are under threat and require community action to ensure their survival in the area.		Greater knowledge regarding at risk species	2010	Very High	Regional	EPA Land Managers
	B&M	24.5 Undertake a review of flora and fauna record databases to ensure that the threatened species are currently found in the catchment		Greater understanding of the status of threatened species	Every five years	High	Regional	EPA,
	I	24.6 Improve knowledge and define best practice management of ground cover for the conservation of all "at risk" regional ecosystems to ensure the maintenance of habitat and species diversity	M 22.1	Greater understanding of best management practice to preserve at risk regional ecosystems	2005	High	Regional	EPA
	B&M	24.7 Improve community involvement in at risk species management and strengthen partnerships between organisations by co-ordinating community extension activities		Increased community participation in protection of at risk species	2008	Medium	Regional	EPA, CHRRUP, FBA, Community



2.4 Pest Plants and Animals

Pest Plants and Animals impact on the diversity and viability of the region. They impact on the region in three ways.

- a) Economic losses are caused through losses in production, predation of stock and costs of control.
- b) Environmental impacts include losses of biodiversity, destruction of habitat and indirect threatening processes such as increased erosion.
- c) Social impacts include health effects from species such as parthenium, stress from increase economic burden on primary producers and a loss of aesthetic value of the landscape.

For these reasons, certain plants and animals are declared as pest, and as such must be controlled.

The Land Protection (Pest and Stock Route Management) Act 2002 (Qld) establishes principles of pest management for land, and stock route network management.

Declared pests are divided into three categories. Class 1 are generally exotic to the state. Class 2 are established in Queensland and have a serious adverse impact. Class 3 are established in Queensland and could have an adverse impact. Following is a list of declared weeds under the Land Protection (Pest and Stock Route Management) Regulations 2003.

All inspections will include Class 1 pests. If a Class 1 pest is discovered, it will become the highest priority for eradication.



Figure 18. Parthenium flower

Photo courtesy of Michael Rodgerson, Department of Natural Resources and Mines, Emerald



Class Two Pests

Plants	Animals
<p>African box thorn American rat's tail grass Annual ragweed *Belly-ache bush Cabomba *Chinee apple Fireweed Giant Parramatta grass *Giant rat's tail grass Giant sensitive bush Groundsel bush *Harrisia cactus *Hymenachne Mesquites *Mother of millions *Parkinsonia Parramatta grass *Parthenium Pond apple *Prickly acacia *Prickly pear *Rubber vine Salvinia Sicklepods Thunbergia Tobacco weed Water hyacinth Water lettuce</p>	<p>*Australian plague locust *Cat, other than domestic cat *Dingo *Dog, other than domestic *European fox *European rabbit *Feral pig *Goat, other than domestic *Migratory locust *Spur throated locust</p>

*Currently found in the Central Highlands

Class three pests

Plants	Animals
<p>African fountain grass *African tulip tree Aristolochia *Asparagus fern *Athel pine Balloon vine Blackberry Broad leaved pepper tree *Camphor laurel *Captain cook tree *Cat's claw vine Chinese celtis Harungana *Lantana (all species) *Madeira Vine *Pencil willow Privets Purple rubber vine Singapore daisy Yellow bells</p>	

*Currently found in the Central Highlands



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2.4 Pest Plants and Animals

Resource Condition Targets	<p>R 19 Contain and reduce the impact of pest plants and animals at a catchment level in a coordinated approach by 2013</p> <p>R 20 The impact of weeds (class 2) is stabilised in strategic areas by 2013</p> <p>R 21 No outbreaks or establishment of new plant and animal pests beyond the regions capability for eradication within the Comet and Nogoja catchment.</p>
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Management Action Targets	Method	Actions	Links	Outcomes	Time Frame	Priority	Focus	Implementation Responsibility
M 25 Managers of all properties within strategic or high priority areas that contain class 2 & 3 weeds be consulted and assisted with the development of Property Management Plans incorporating pest management	OG	25.1 Continue to support collaborative effort of shires with regards to pest plants and animals through Central Highlands Natural Resource Management Group eg. Neighbourhood Catchment projects		Best management of pest plants and animals within the shires	On going	High	Regional	Local Government, CHINRMG,
	E&A	25.2 Promote adoption by transport companies, government departments and service providers of the use of vendor declaration forms by 2004 Come clean, Go clean program		Vendor declaration forms in common usage	June 2004	High	Regional	Transport companies, Local Government, NR&M, Queensland Transport
	I	25.3 Carry out surveys in gap areas not identified in Pest Info throughout the catchments to record density and abundance of pest plant and animals biannually or when practicable		Improved database of pest plant and animal infestations	2004	High	Regional	Local Government, NR&M, Land Managers
	I	25.4 Local government to review current pest management plans and develop Stock Route Management Plans under the Land Protection (Pest and Stock route management) Act 2001		Compliance with legislation	July 2004	High	Regional	Local Government, CHINRMG
	OG	25.5 Develop strategies to manage and minimise Pest plants and animals (Native eg. Locusts, CQ Rats, black wattle)		Integrated approach to pest management	2008	High	Regional	EPA (Parks and Wildlife), Local Government, NR&M, CHINRMG
	OG	25.6 All mines to develop pest plant and animal management plans in consultation with and seek endorsement by local landholders, community and local government		Greater involvement by mines	2006	High	Regional	Mining companies



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	OG	25.7 Interpretive material that can assist the community and all key stakeholders to identify potential new weeds and pests be produced	Useful pest information accessible to community	2006	High	Regional	NR&M, EPA
M 26 Implement appropriate strategies for managing invasive aquatic species	I	26.1 Survey aquatic ecosystems to map and develop a database of invasive aquatic species in the catchment	Pest Info Database updated to include aquatic species	2006	High	Regional	NR&M, Local Government, Land Managers
	E&A	26.2 Carry out program to raise awareness of invasive aquatic species incorporate with current awareness programs	Improved management of invasive aquatic species	2006	High	Regional	Local Government, NR&M, CHNRMG, EPA
M 27 Develop a weed management action plan or strategy for 5 at risk species that are directly affected by weeds	OG	26.3 Develop appropriate strategies for managing invasive aquatic species incorporate in Shire Pest Management Plans	Improved management of invasive aquatic species	2006	High	Regional	Local Government, NR&M, CHNRMG, EPA
	B&M	27.1 Use Pest Info for monitoring pest plants and animals distribution and density within the Central Highlands	Improved awareness of pest plant and animal activity	On-going	High	Regional	Local Government, NR&M, CHNRMG
	B&M	27.2 Photo monitoring be promoted as basic monitoring tool at a property level to provide evidence of change at a property level	M 1.4 Monitoring adopted at a property level for pest management	On-going	High	Regional	Land Managers, Local Government
	OG	27.3 Continue to provide support and resources to Local Government for coordination of Pest Management	M 1.3 Increased pest management activity	On-going	High	Regional	Local Government, NR&M, CHNRMG, State Agencies
	OG	27.4 National Parks to develop pest management plans to ensure a coordinated approach to Pest Management	M 7 Improved management of pests in National Parks	On-going	Medium	Regional	EPA (Parks and Wildlife), NR&M



3. River Health and Water Quality

Aspirational Target

By 2050 the regions river systems sustain aquatic resources with no net decline and where appropriate improvement, in regional river health and water quality

The health of the rivers and streams within the Central Highlands is a key issue in the region. Everyday living impacts on the health of the waterways and this is reflected in the way we need to manage our natural resources.

Water quality provides the bigger picture of river health, both physical and chemical. This includes the management of in stream habitats, floodplains, wetlands and riparian zones. Poor water quality reduces the productivity and the value of the riverine environment. Water that is contaminated can seriously impact on animal and human health.

Contributing causes to declining river health include runoff into streams and groundwater contaminated by pesticides, nutrients, effluent and sediment. Urban areas, mine and industrial sites, agricultural and pastoral land all contribute to this runoff.

Weed infestation and the over-allocation of regional water resources also contribute to declining water quality and river health.

Due to the relationship between land use and water quality, an integrated approach is needed when dealing with river health and water quality. In particular, land managers and the community need to work closely with industry and government to ensure river health and water quality are maintained.

The riparian vegetation along waterways provides critical wildlife linkages across the landscape. The maintenance of this vegetation is critical to terrestrial biodiversity, aquatic biodiversity and water quality.



Figure 19. Minor stream - trees provide good shelter for aquatic habitat

Photo courtesy of Department of Natural Resources and Mines



3.1 River Health

The health of the rivers in the Central Highlands is reflected in the way we use water in the region. The rivers of the region are the report cards for the way we manage our natural resources.

Riparian vegetation is important for the health of a river. Riparian vegetation provides:

- In-stream habitat for many aquatic species, such as snags and large woody debris
- Food sources such as fruit and insects
- Shading of pools (improved dissolved oxygen) and shelter
- Reduced stream bank erosion
- Increased connectivity of vegetation.

3.1 River Health

Resource Condition Target	R 22 Improve the condition or area of 20% of of concern riparian areas by 2013 R 23 Retain current habitat variability and condition of riparian reaches with high ecological value in Comet, Nogoa and Theresa Creeks R 24 Fragmentation of key wildlife corridors, particularly riparian areas, is reduced by regenerating 1,500ha of wildlife habitat				
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Management Action Targets	Method	Actions	Links	Outcomes	Time Frame	Priority	Geographic Focus	Implementation Responsibility
M 28 Implement programs for the management of riparian areas along the significant wildlife corridors on a sub catchment basis	OG	28.1 Manage thickening of native species in riparian zone in a sustainable maer 28.2 Determine most effective dimensions and appropriate actions to improve riparian function by 2006	M 19.2	Sustainably managing native vegetation	On-going	Medium	Regional	Land managers, EPA
	I			Riparian habitat protected and function increased	2006	High	Regional	EPA



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M 29 Define what an important aquatic habitat area is by 2006	E&A	28.3 Education and awareness of what constitutes functional riparian habitat 28.4 Investigate the option of off-stream watering and light grazing in riparian management	M 17.3	Improved awareness of riparian areas	On-going	Very High	Regional	EPA, FBA, CHRRUP
	OG	29.1 Support the development and adoption of industry-led selfmanagement programs that promote best practice management in riparian lands		Improved riparian management	On-going	Medium	Regional	DNR&M, Land managers
	I	29.2 Identify locations with good functional riparian habitat by 2006		Greater understanding of what constitutes functional riparian habitat	2006	High	Regional	EPA
	I	29.3 Identify and understand dysfunctional riparian areas		Key locations identified to enable protection	2006	High	Meteor Creek	EPA
	OG	30.1 Maintain pool/shallow water habitat balance in important areas with good aquatic habitat variability and connectivity		Maintain functional riparian area	2006	High	Regional	Landholders, State Agencies, Local Government
	M 30 Protection of all identified remnant good quality, functional riparian habitat from tree clearing by 2006 (Act on permanent / semi-permanent waterholes first)							



3.2 Wetland Management

A wetland (in its wet phase) is a permanent or temporary area of fresh, brackish or saline water that is typically shallow, slow-moving and reasonably well vegetated. A key aspect of this target is to identify natural wetlands in the region, and to better understand the value of artificial wetlands and how to manage these without compromising agricultural productivity.

Wetlands have an important role in natural resource management, including:

- enhancing water quality by trapping sediments, pesticides and nutrients
- mitigating floods by absorbing large quantities of water run off
- providing refuges for wildlife in dry seasons
- sustaining grazing long after floods have receded
- contributing to the aesthetic value of the landscape

As the majority of wetlands occur on private land, the ongoing care by landholders is vital. Many landholders recognise the value of their wetlands, but ongoing recognition and management is a key management action. Wetlands contribute to agricultural production by providing forage during lean periods, a reservoir of water for emergency use and refuge and breeding habitat for beneficial insect eating species.

There is a community concern that primary producers should not be forced to modify their management practices in order to protect artificial wetlands (those that are man made), to the same extent as for natural wetlands.

Achieving dual aims of increased productivity and wetland conservation requires thoughtful management. Grazing management practices, which protect native plants and maintain species diversity in wetlands are best for habitat preservation, for example if stock can be watered via fenced and preferably protected access points. It may also be preferable for stock to graze from a clean water source rather than muddy wetland edges.

The Fairbairn Dam and Lake Nuga Nuga are important wetlands in the Central Highlands. The Fairbairn Dam is an important dry season refuge for waterbirds and is a significant, large, permanent water body in central Queensland. Although artificial it provides the equivalent of a natural lake and swamp habitat. Lake Nuga Nuga is a large water body in an otherwise semi arid area, with some Aboriginal sites are included in the area



Figure 20. Nuga Nuga National Park

Photo courtesy Department of Natural Resources and Mines



3.2 Wetland Management

Resource Condition Target	R 25 Improve natural wetland values while still maintaining their function and viability by 2013							
Management Action Targets	Method	Actions	Links	Outcomes	Time Frame	Priority	Geographic Focus	Implementation Responsibility
M 31 Value the importance of artificial wetlands by 2006	E&A	31.1 Industry groups and councils to be educated and encouraged to construct and utilise artificial wetlands		Wetlands used to improve water quality	On-going	Medium	Regional	DNR&M, Industry, Local Government
	E&A	31.2 Provide information to improve the natural value of wetlands on farms		Increased community awareness of wetlands and their value	2006	Medium	Regional	DNR&M, Land Managers
M 32 Identify and map natural wetlands within the region and their role by 2006	OG	32.1 Implement voluntary incentive programs for wetland management/improvement		Increased management of wetlands by landholders	June 2006	Medium	Regional	State and Local Governments



3.3 Water Quality

Water quality monitoring provides the bigger picture of river health. An understanding of different water quality parameters provides increased awareness of how different land management techniques impact on the environment.

Many of the management actions referred to elsewhere in the Plan (particularly the land management actions in Part 1) will have a positive impact on water quality in the Central Highlands. Reductions in sediment loads entering the river system will have positive impacts on the riverine and marine ecosystems.

National water quality guidelines (ANZECC 2000) have been developed to provide ranges for different uses of water. This includes drinking water, stock drinking and for aquatic species diversity.

The ANZECC guidelines for water quality do not accurately reflect regional water quality in the Central Highlands. In this region, turbidity levels (which measure the cloudiness of the water) are historically higher than those in the guidelines. Many of the soil particles are very fine and do not settle.

This creates increased sedimentation, and the appearance that the rivers are very murky. The management actions identified below relate to developing specific water quality guidelines for this region. There is a lot of monitoring data available which clearly demonstrates that the National guidelines are not reflective of our region. However, increased monitoring in strategic areas during high and low flow is still needed to be able to confidently set targets for the region, and then realistically be able to measure progress against these.

Surface and groundwater salinity levels are usually within the guidelines for Australia. However, increased monitoring will allow us to identify areas of salinity concern. There is a high variability of nutrient levels (phosphorous and nitrogen) recorded in most areas of the Central Highlands. Much ad hoc monitoring has occurred, however this does not provide adequate long-term information to understand trends in nutrient levels.

The first step in developing guidelines for this region will be to identify good reference sites that are reflective of the diversity of land in the region.



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3.3 Water Quality

Resource Condition Target	<p>R 26 Develop water quality reference sites and guidelines appropriate for the Central Highlands region by 2013</p> <p>R 27 Maintain and reduce current EC levels in all aquatic ecosystems</p> <p>R 28 Maintain recharge levels in groundwater</p>
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Management Action Targets	Method	Actions	Links	Outcomes	Time Frame	Priority	Geographic Focus	Implementation Responsibility
M 33 Collect total nitrogen and total phosphorus data set for reference site allow local reference guidelines to be developed by 2006	B&M	33.1 Establish key reference sites that reflect different soil types, land uses and natural systems by 2006		Greater understanding of different soil types and land uses	June 2006	High	Regional	DNR&M
	OG	33.2 Increase the collection of water quality information with local relevance. Involve local networks and collect data in a coordinated manner eg Integrated Area Wide Management model.		Comprehensive data collected and available in useful form	On-going	High	Regional	DNR&M, Waterwatch, CHRRUP, Land Managers
	OG	33.3 Collect water quality information under different flow conditions at key reference sites		Increased knowledge of local water patterns	2007	High	Regional	DNR&M, Land Managers, Waterwatch
	B&M	33.4 Establish background levels for turbidity and nutrients in the region, reflecting different soil types and local information by 2006		Comprehensive data collected and levels established	2006	High	Regional	DNR&M
	B&M	33.5 Develop a strategic monitoring program using local information, soil types, land uses and natural systems		Strategic monitoring program in place	2008	Medium	Regional	FBA, DNR&M, Land Managers
	OG	33.6 Aim to reduce point and diffuse inputs of Nitrogen and Phosphorus		Reduction in point and diffuse sources	On-going	High	Regional	Community, Land Managers
	E&A	33.7 Local government to educate and increase awareness in reducing the use of nitrogen, phosphorus and pesticides, and solid waste (e.g. plastic bags) in urban areas		Reduction in use of nitrogen, phosphorus and pesticides in urban areas	On-going	Medium	Urban areas	Local Government



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M 34 Identify salinity hot spots and areas of risk and manage appropriately by 2008	I	34.1 Develop a shared understanding of the interaction between surface and groundwater flow systems, between water quantity and water quality at a sub catchment scale. 34.2 Monitor groundwater bores and respond to evidence of increased salinity or rising groundwater tables	M 14.3	Increased local knowledge of water issues Improved management of salinity	On-going	High	Regional	DNR&M, Waterwatch
	B&M				On-going	Medium	Regional	DNR&M, Land Managers
M 35 Collect turbidity (NTU or total suspended solids) data set for reference site or neighbourhood catchments allow local reference guidelines to be developed by 2008 or earlier if seasons allow (links to Soil Condition targets)	E&A	35.1 Increase awareness of water quality and provide training opportunities for landholders to monitor water quality on the land eg. Waterwatch, and industry self-management programs e.g. Cotton BMPs, Rural Water Use Efficiency Initiative.		Increased landholder awareness of water quality issues	On-going	Medium	Regional	Waterwatch, Industry, CHRRUP
	OG	35.2 Aim to reduce point and diffuse catchment inputs of suspended particulate matter	M 12.5	Reduction in point and diffuse sources	2008	Medium	Regional	Sunwater, Land Managers
M 36 Continue to educate the community about Water Quality and the impact different management actions may have on water quality	OG	36.1 Allow water use (stock and irrigation) for current and future agricultural needs, balancing for the environment		Competing requirements of agriculture and environment balanced	On-going	Medium	Regional	Sunwater, DNR&M
	OG	36.2 Continue to minimise the impacts/use of pesticides through Industry BMP eg. Cotton and urban uses	M 1.4	Use of pesticides by industry and urban areas reduced	On-going	Medium	Regional	Irrigation Industries, CRC, Land Managers



4. Cultural Heritage

Aspirational Target

By 2050 cultural heritage sites and values are identified, conserved and protected and valued

Cultural heritage is described as those things or places which represent who we are, and where we have come from. The management of our cultural heritage is important in preserving and promoting cultural identities and allowing us connection, or a sense of belonging to a certain place.

For aboriginal people, maintaining a strong attachment to particular landscapes and natural places is a critical part of protecting their cultural heritage.

In this region there is also increasing recognition of the value and role of European and Indigenous cultural heritage in environmental and natural resource management and decision-making. By understanding the links that people have with certain places, the present condition of natural resources can provide a history of resource use in the region.¹⁹

Knowledge of our heritage and past land management practices can therefore improve the sustainability of our current methods of resource use.

European and Indigenous cultural heritage may easily be damaged or lost through insensitive planning, resource use or development. Other pressures such as loss of knowledge of special places or vandalism are equally critical to address.



Figure 21. Tombs, Carnarvon NP

Photo courtesy of Department of Natural Resources and Mines

¹⁹ COSS



4. Cultural Heritage

Resource Condition Target	<p>R 29 Aboriginal control over indigenous cultural heritage (places, sites, artefacts, intellectual theft) by 2013</p> <p>R 30 No land management, planning or development impacts (eg. Clearing, dams, weirs) in culturally sensitive areas by 2013</p> <p>R 31 Proactive regional planning that avoids location of development in culturally sensitive areas</p>
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Management Action Targets	Method	Actions	Links	Outcomes	Time Frame	Priority	Geographic Focus	Implementation Responsibility
M 37 Collaborate with Indigenous groups to establish protocols for management of cultural heritage	OG	37.1 Assist with resolution of Native Title Claims through the development/negotiation of land use agreements and the building of good relationships between native title holders and others with an interest in land and land management		Cooperative approach	2006	Medium	Regional	FBA, Fitzroy Basin Elders, Landholders, Community
	OG	37.2 Continue to support and expand capacity building for murri groups in the Central Highlands Central Highlands Aboriginal Corporation in Emerald and the Sandy Creek TSI Assoc in Clermont	M 44.2	Strong community involvement representing indigenous initiatives	On-going	Medium	Regional	CHRRUP, FBA, Landholders
	OG	37.3 Collaborate with Indigenous groups to establish protocols for Aboriginal input into land management and planning		Land management and planning to incorporating Aboriginal involvement and input	On-going	High	Regional	FBA, Land holders, FBEC
	E&A	37.4 Establish promote and facilitate traditional owner partnerships with other organisations		Greater coordination in decision making	On-going	High	Regional	CHRRUP



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M 38 Develop a greater understanding of our cultural heritage through the development of a database	E&A	38.1 Appropriate information about cultural heritage places (including Elders knowledge) is collected and distributed	Increase community knowledge	2010	Medium	Regional	FBA
M 39 Develop a contact system for industry/employment organisations/community groups to obtain advice and be able to involve indigenous people in initiatives	I OG	39.1 Pursue opportunities to extend European and Indigenous cultural heritage surveying through entire region 39.2 Meet legal requirements and implement best practice for assessment and protection of cultural heritage	Increase in cultural heritage surveying Achievement of best practice in cultural heritage protection	2005 On-going	Medium High	Regional Regional	FBA FBA Landholders, FBEC



5. Sustainable Communities

Aspirational Target

By 2050 the region has a robust and well-balanced economy that is economically, socially and ecologically sustainable, and able to with stand external pressures

The local urban and rural community is already carrying out many of the actions identified in the Plan. The management actions identified in the Plan highlight what the community feels is necessary to protect our natural resources.

The Plan provides a tool that can be used to promote current best management practice through different mediums, and draw on local knowledge showing the improvements to land use management.

The management of our natural resource can provide a tool for increased viability of the region. This can be achieved through:

- Increasing services to the region
- Providing a well defined skills base within the local community
- Building a greater understanding of Best Management Practice
- Building greater relationships and understanding of the impact different planning tools have on the Central Highlands community
- Providing education packages that can be used in schools and throughout the region, to ensure that future generations continue to appreciate our natural resources
- Providing support to land managers

It is recognised that the natural resources of the region are limited and unique. It is also seen as important to retain assets and equity within the Central Highlands.

The Central Highlands community already understands the importance of protecting our natural assets and strives to live in a sustainable manner. As the Plan has been developed by the community, a strong desire was expressed for the development of a Memorandum of Understanding (MoU) between the community and Government to ensure that the Plan remains a tool for the reporting and monitoring by the community of the management of the natural resources of the Central Highlands.



Figure 22. Working together to understand the environment

Photo courtesy of CHRRUP



5.1 Social Viability

Resource Condition Target		R 33 Harness the knowledge and power in the local community R 34 Flexibility in the Targets to allow for new knowledge and improved management of Natural Resources						
Management Action Targets	Method	Actions	Links	Outcomes	Time Frame	Priority	Geographic Focus	Implementation Responsibility
M 40 Develop marketing tools to promote good land management in rural areas media coverage in urban areas (e.g. celebrities in the bush)	OG	40.1 Develop a greater relationship with other Natural Resource Management Organisations develop a Memorandum of Understanding for Reef Protection		Strong and useful relationships in place between natural resource management groups	2003	Very high	Regional	CHRRUP
	E&A	40.2 Educate the community about Natural Resource Management through media positive stories, how the land is being managed now		Strategic media coverage across all sectors of Australian community	Ongoing	High	Regional	CHRRUP, CHINRMG
	E&A	40.3 Bring vested interests together through workshops/ seminars/ tours to give examples and allow for expression of new ideas/techniques		Greater unity and co-operation regarding NRM issues	Ongoing	Medium	Regional	CHRRUP
	E&A	40.4 Acknowledge and promote the efforts of landholders who voluntarily adopt property management planning as contributing to good land management and sustainable natural resource management.	M 1.4	Improved natural resource management through adoption of sustainable and best practice management.	Ongoing	Medium	Regional	CHRRUP
M 41 Educate the urban community about catchment management and how they can become involved	E&A	41.1 Increase the urban communities awareness of Best Management Practices on rural land	M 1.4	Increased awareness in urban areas of land management issues	Ongoing	Medium	Urban areas	Local Government, CHRRUP
	OG	41.2 Quantify the infrastructure and services required to ensure a viable community		Improved understanding of community needs	2006	Medium	Urban Areas	Local Government
	OG	41.3 Promote Rolleston as the gateway to the Carnarvon		Improved tourism in Rolleston	Ongoing	Medium	Rolleston area	Local Government, Community
	I	41.4 Investigate reward systems for good practices eg. Tax incentives for water points	M 17.3 M 40.4	Potential incentive systems identified and pursued	2005	Medium	Regional	CHRRUP



5.2 Economic Viability

Resource Condition Target		R 35 Maintain and increase economic viability of the region						
Management Action Targets	Method	Actions	Links	Outcomes	Time Frame	Priority	Geographic Focus	Implementation Responsibility
M 42 Educate the community on alternative industries and opportunities	I	42.1 Investigate alternative land uses in the Central Highlands: eg. Mill for industrial hemp production		Any viable alternative industries identified	Ongoing	Low	Regional	Local Government
	I	42.2 Investigate new/existing industries that will benefit from being in the Central Highlands		Industry leaders identified and approached about potential of operating in the region	Ongoing	Low	Regional	Local Government
	I	42.3 Low interest, long term loans made available as a form of drought assistance		Potential alternative forms of drought assistance investigated	Ongoing	Low	Regional	AgForce
	I	42.4 Investigate compensation for managing remnant vegetation on productive land	M 19.1 M 42.4	Possibility of compensation explored	2005	Medium	Regional	EPA, Industry
	OG	42.5 Reduce awards for poor management and increase the award for best management practices		Reward best management practice	Ongoing	Medium	Regional	State and Federal Government



5.3 Capacity Building

Resource Condition Target		R 36 Increase the skills and knowledge of the community in the region by 20% in relation to their understanding and ability to address natural resource management issues by 2013						
Management Action Targets	Method	Actions	Links	Outcome	Time Frame	Priority	Geographic Focus	Implementation Responsibility
M 43 Increase the capacity of informal networks and empower existing networks	E&A	43.1 Increase access to learning tools throughout the region		Improved knowledge and skill	Ongoing	High	Regional	Local Government, Community Groups
	E&A	43.2 Increase local skills through-going commitment to the community (open active learning programs)		Healthy adult learning environment within the region	Ongoing	High	Regional	CHRRUP, Local Government
M 44 Ensure support for Landholders to engage in property management planning	E&A	44.1 Increase the capacity of school students in understanding current Natural Resource issues		Active teaching of natural resources issues in schools	Ongoing	High	Regional	CHRRUP, Waterwatch, CHNRMG, School groups
	OG	44.2 Support the establishment of an Indigenous Land and Sea Management Group, whose role would be to continue building the capacity of Aboriginal people to engage with Government and Community in Natural and Cultural Resource Management by 2004	M 37.4	Building the capacity of Aboriginal people to engage with Government and Community in Natural and Cultural Resource Management	2004	Medium	Regional	Fitzroy Elders
M 45 Ensure that best management practices of different land uses is updated and made available	E&A	45.1 Regional definition of sustainability understood by the whole community		Community understands what sustainability means in the region	2006	High	Regional	CHRRUP



6. Regional Coordination

Aspirational Target

By 2050, urban and rural people use and manage their resources in an ecologically, socially and economically sustainable way

The Plan has been developed in partnership between the Fitzroy Basin Association, Central Highlands Regional Resources Use Planning Co-operative, State and local Agencies and the community, both urban and rural. The implementation of this plan will only occur through coordination and integration of this partnership.

The following actions describe the coordination of the Plan and will provide a valuable tool to CHRRUP in assessing the implementation of the plan.

The coordination of the Plan has six major components:

- Ensure coordination between all stakeholders and sectors
- Assist the development of a works program to address the Plan's priorities
- Provide information and advice on natural resource management to agencies and landholders
- Prepare and coordinate funding bids which address identified priorities

- Compile annual reports on the implementation of the Plan
- Undertake the review of the Plan every five years to ensure that the latest information is always available

- Ensure that the plan is linked to and complimentary to other regional plans eg. Reef Water Quality Plan, COSS2, CQ A New Millennium

There is a feeling of isolation between urban and rural communities, as each area struggle with different requirements and legislation for land use. There is a need to educate both urban and rural communities of the partnerships needed and the reliance that each has on the other.

There is a need to also promote and encourage fair outcomes in the achievement of all targets for the region, including indigenous issues, property rights, economic incentives and compensation, as well as intergenerational equity.



6. Regional Coordination

Resource Condition Target		R 37 Build stronger relationships between rural and urban communities						
Management Action Targets	Method	Actions	Links	Outcomes	Time Frame	Priority	Geographic Focus	Implementation Responsibility
M 46 Monitoring of our natural resources is done strategically with all information made available to everyone	B&M	46.1 Develop guidelines for Property Management Plans that reflect the needs of the community by 2004	M 1.4	Appropriate useful guidelines in place	2004	High	Regional	State Agency CHRRUP, FBA, AgForce
	B&M	46.2 Ensure monitoring and reporting is a transparent process	M 1.3 M 33.5	Easily accessible information	Ongoing	High	Regional	CHRRUP
	OG	46.3 Develop a Memorandum of Understanding between the Community and Government outlining the role of the Regional Natural Resource Management Plan by 2004		The role of the Plan is understood by all	2004	High	Regional	CHRRUP
	I	46.4 Establish current skills audit and knowledge in natural resource management by 2004		Confidene in natural resource management knowledge base within the region	2004	High	Regional	CHRRUP, FBA
M 47 Review Plan every 5 years to track progress and ensure it is a living and relevant document	B&M	47.1 Ensure that the Plan is complimentary and inline with other plans for the region eg. COSS2, COANM.		Make certain the plan is complimentary to and inline with regional plans	Ongoing	High	Regional	CHRRUP
	B&M	47.2 Continue to investigate new scientific findings as they relate to NRM and incorporate in the plan as they occur		Ensure that the plan is a living and relevant document	Ongoing	Medium	Regional	CHRRUP, FBA, DNR&M
M 48 Create a better understanding of the interdependence of rural and urban communities	E&A	48.1 Awareness programs developed for both urban and rural communities outlining how each uses natural resources in the catchment by 2005		Greater wider community awareness of our use of natural resources	2005	High	Regional	Local Government, CHRRUP



Implementation and evaluation of the Plan

The Plan will be implemented through voluntary action by land managers and the community, through partnerships with peak bodies and industry and through the implementation of funding applications approved under NAPSWQ.

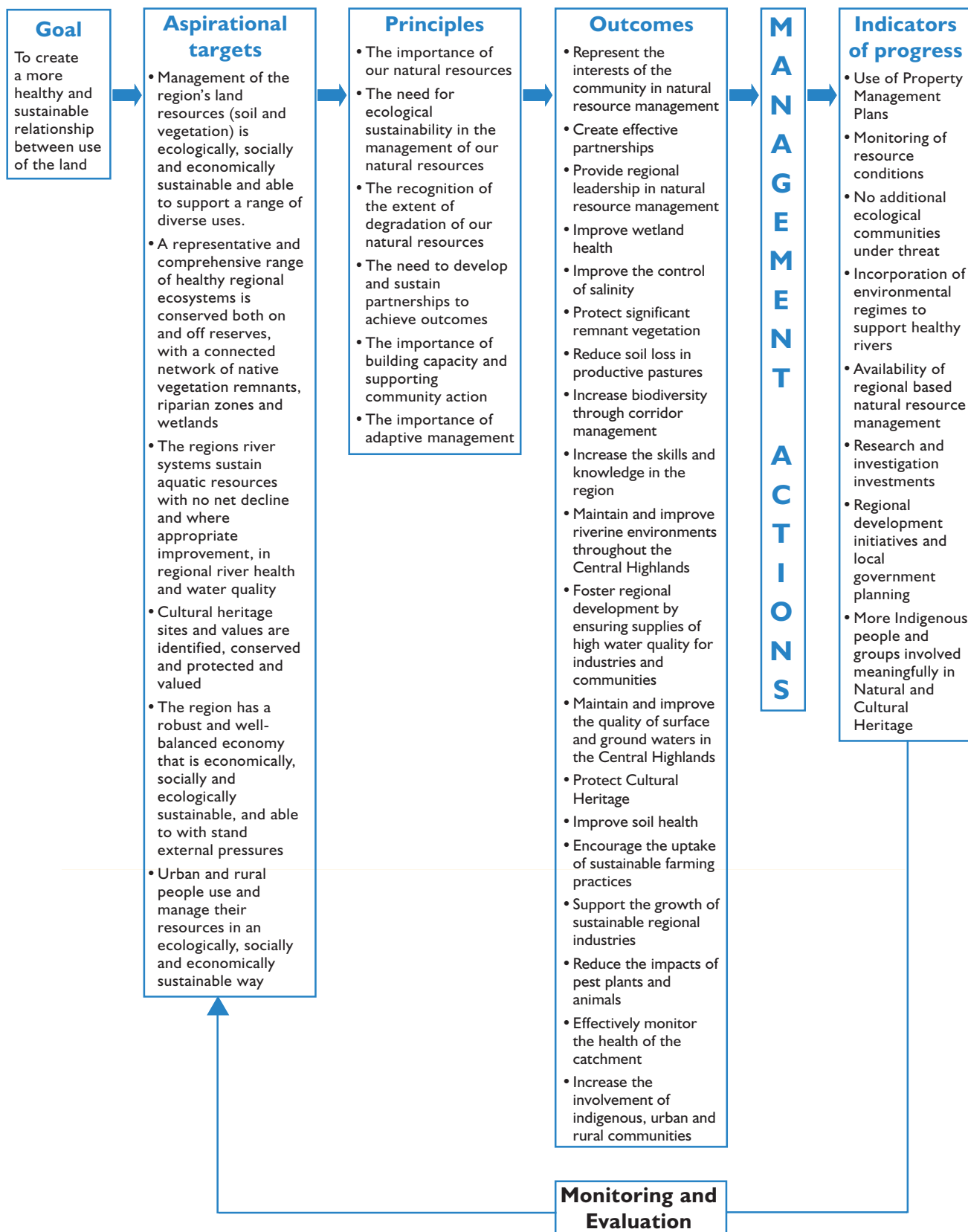
The monitoring and evaluation framework will be a reporting tool for the implementation of the Plan. The protection of our natural resources will be driven by all actions in the Plan, not just by one area. All management actions are interrelated with other management actions.

The Plan already includes some broad monitoring actions, but the monitoring and evaluation framework will describe how often a management action needs reporting, who is responsible for reporting the progress of a management action, and how the monitoring will take place. It will also track the cost of many of the actions prescribed in the Plan.

Figure 23 provides a visual image for the evaluation of the Plan.



Figure 23. The Way Forward – Implementation and Evaluation of the Plan





APPENDIX I – Bibliography

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APPENDIX 2 – Endangered and of concern ecosystems

The Central Highlands is classified as part of the Brigalow Belt region. Under the Regional Vegetation Management Plan for the Southern Highlands there are 81 regional ecosystems that have been classified to enable a distinction between endangered and non-endangered vegetation types in the plan. In the Central Highlands, 19 ‘Endangered’ regional ecosystems have been classified as protected and 21 ‘Of Concern’ regional ecosystems.

An **endangered** regional ecosystem is a regional ecosystem that has either (a) less than 10% of its pre-clearing extent remaining; or (b) 10-30% of its pre-clearing extent remaining and the remnant remaining vegetation is less than 10,000 ha.

An **of concern** regional ecosystem is a regional ecosystem that has either (a) 10-30% of its pre-clearing extent remaining and is greater than 10,000 ha; or (b) more than 30% of its pre-clearing extent remaining and the remnant remaining vegetation is less than 10,000 ha.

A **not of concern** regional ecosystem is a regional ecosystem that has greater than 30% of its pre-clearing extent remaining and the remnant remaining vegetation is more than 10,000 ha.

Many endangered regional ecosystems are protected from clearing. The Regional Vegetation Management Plan prescribes for the protection of 30% vegetation cover in the whole region.

Below is a table identifying the ‘**Endangered**’ regional ecosystems in the Central Highlands.

	Regional Ecosystem	Distribution
11.3.1	Open forest of Brigalow	Found predominantly in the eastern part of the region in the riparian and alluvial areas along the Comet, Minerva, Sandhurst, Nogoia and Theresa Creeks
11.3.11	Semi-evergreen vine thicket and semi deciduous notophyll rainforest on alluvial plains	Very limited extent found in patches along the Comet River and its tributaries west of Struan
11.3.21	Grassland of Queensland bluegrass	Found predominantly in the southern part of the region in the riparian and alluvial areas of Buckland Creek, Vandyke Creek and Reedy Creek
11.4.1	Semi-evergreen vine thicket on clay plains	Limited extent, found predominantly adjacent to Sandhurst Creek, west of Bonnie Doon
11.4.3	Brigalow	Found scattered around the region, predominantly south west of Fairhill, east of south Blackwater and Humbolt and south of Mira
11.4.7	Poplar box, brigalow and tall woodland on clay plains	Found in patches throughout the region, predominantly near localities of Mantaun Downs, South of Nebea and southeast of Humbolt
11.4.8	Dawson Gum, brigalow and blackwoods on clay plains	Found scattered predominantly throughout the northern part of the region
11.4.9	Brigalow shrubby open forest to woodland usually with yellowwood	Found scattered predominantly throughout the eastern part of the region
11.5.15	Semi-evergreen vine thicket, deep red and yellow earths	Limited extent, patches around Sirius and triumph creek near Comet downs
11.5.16	Brigalow and Belah open forests on sand plains	Found near the eastern boundary of the region near Blackwater mines, comet downs, Struan and South Blackwater
11.8.15	Reid river box or poplar box grassy woodlands	Limited extent, found adjacent to Cona Creek
11.9.1	Dawson gum or ya punyah, brigalow shrubby open forest	Scattered throughout the southern and eastern parts in the region. Predominant patches are north and east of Castlevale
11.9.4	Semi-evergreen vine thicket	Scattered and fragmented around the southeast of the region
11.9.5	Brigalow shrubby open forest	Found mainly in the south of the region, predominantly around the localities of Castlevale and Mt Ka Ka Mundi
11.9.8	Bonewood thicket on lowlands	Found mainly in the south of the region
11.9.12	Queensland bluegrass grassland with clumps of low brigalow	Limited extent, scattered and fragmented. Found between the localities Kareela and Mt Cheops
11.11.17	Queensland bluegrass	Limited extent towards the centre of the region, north and south of the Nogoia River, near Vandyke Creek
11.11.18	Semi-evergreen vine thicket on Lowlands	Limited extent near the centre of the region east of where the Nogoia joins Vandyke Creek
11.12.21	Brigalow open forest	Very limited extent east of the Nogoia River Anabranh and yellowberry Creek



Below is a table identifying the ‘**of concern**’ regional ecosystems in the Central Highlands.

	Regional Ecosystem	Distribution
11.3.2	Poplar box (<i>Eucalyptus poplunea</i>) woodland on alluvial plains. Texture contrast and deep clay soils	Found extensively in riparian and alluvial areas, predominantly in western half of the region
11.3.3	Coolibah (<i>E. Coolabah</i>) grassy to open woodland on alluvial plains	Found extensively in riparian and alluvial areas, predominantly along Native Companion Ck, Belyando R, Nogoia R and Capella Ck.
11.3.4	Blue Gum (<i>E. tereticornis</i>) and/ or River Red Gum (<i>E. camaldulensis</i>) tall woodland on alluvial plains	Found in riparian and alluvial areas of the S-E part of the region, including VanDyke, Yellowberry, Oaky, Taranguay, Aldebaran and Pinnacle Creeks
11.3.17	Poplar box with Brigalow (<i>Acacia harpophylla</i>) and/ or Belah (<i>Casuarina cristata</i>) on alluvial plains	Found in riparian and alluvial areas in southern parts of region along Claude, Nogoia Rivers, and Wharton, Buckland, Meteor and Joe Joe Creeks
11.3.33	False sandalwood (<i>Eremophila mitchelli</i>) open woodland on alluvial plains	Very limited extent, sub-dominant regional ecosystem near NW boundary of region adjacent to Native Companion Ck, N of Eulimbie
11.4.2	Poplar box and <i>Eucalyptus-Corymbia</i> grassy or shrubby woodlands on clay plains	Found scattered around eastern half of region. Most predominant S of German Creek
11.4.12	Poplar box woodland on eroding edge of Cainozoic clay plains	Limited extent, sub-dominant regional ecosystem; found predominantly around Nogoia River between Mantuan Downs, Buckland Plains and Petrona
11.5.10	Desert teatree (<i>Melaleuca tamariscina</i>) shrubland on sand plains/ remnant surfaces	Limited extent in small fragmented patches predominantly near Wharton Ck and S of Comet Downs
11.5.18	Heath myrtle (<i>Micromyrtus capricornia</i>) shrubland on sand plains/ remnant surfaces	Found near eastern boundary of region, S of Rhudana and Humboldt
11.8.7	Shrubland (heath) on igneous rocks. Rocky outcrops	Found predominantly towards Mt Alexander towards centre of the region
11.8.9	Pine spp. +/- vine thicket on igneous rocks. Hillsides	Very limited extent, predominantly near Euneeke
11.8.11	Queensland bluegrass (<i>Dicanthium sericeum</i>) grassland on igneous rocks. Lowlands	Found predominantly around eastern and north - eastern parts of the region
11.8.12	Low forest of Grey box (<i>E. microcarpa</i>) and Queensland peppermint (<i>E. exserta</i>) low forest on igneous rocks	Found on northern border of the region, S of Lords Table Mountain
11.9.7	Poplar box, false sandalwood shrubby woodland on Cainozoic fine-grained sedimentary rocks	Found mainly in south of region, predominantly around Mt Northampton, Fairview and Mantuan Downs, and Warrinilla and Mt Ceres
11.9.10	Brigalow, Poplar box shrubby open forest on fine-grained sedimentary rocks	Scattered and fragmented in S of region between Fairview, SE to the border
11.9.11	Brigalow shrubland with emergent <i>Eucalyptus</i> spp. on fine-grained sedimentary rocks	Found in SW corner of region around Castlevale, Mt Northampton, NE of Erne, SW of Mendip Hills, and between Skye and Glen Avon
11.10.2	Tall open forest in sheltered gorges on coarse-grained sedimentary rocks. Sydney blue gum (<i>E. saligna</i>), Turpentine (<i>Syncarpia glomulifera</i>), <i>Livistona</i> spp. And broadleaved shrubs	Limited extent adjacent to Carnarvon Creek, close to southern border of the region
11.10.8	Semi-evergreen vine thicket in sheltered habitats on medium to coarse-grained sedimentary rocks	Found in small fragmented patches around the centre to SE part of the region
11.11.10	Silver-leaved ironbark (<i>E. melanophloia</i>) woodland on deformed and metamorphosed sediments and interbedded volcanics	Found scattered around centre and western parts of region, predominantly between Drummond, Lochington and Mt Bletsoe
11.11.13	Brigalow or Blackwood (<i>Acacia argyrodendron</i>) low open forest on deformed metamorphosed sediments and interbedded volcanics	Scattered and fragmented patches around western part of the region
11.11.16	Dawson Gum (<i>E. cambageana</i>), Brigalow woodland on old sedimentary rocks with varying degrees of metamorphism and folding; lowlands.	Scattered and fragmented in the western part of the region, predominantly S of Retro and Mt Pleasant, and W of Mt Scholfield



APPENDIX 3 – Role of regional bodies in Central Highlands

Set out below is a list of key bodies in the Central Highlands, with a description of their role and interaction with other bodies.

Organisation	Role
AgForce	Represents landholders in pastoral industry. Peak organisation for rural producers. Concerned with resource management, land tenure, environmental issues, international competitiveness and withdrawal of rural community services
Central Highlands Cotton Growers and Irrigators Association	Represents both irrigated and dry land cotton producers in the Central Highlands. Also represents the service industry, and a member of Cotton Australia
Central Highlands Natural Resource Management Group	Facilitates the adoption of Natural Resource Management into Local Government Planning Schemes and co-ordinates a regional approach to pest and stock route management issues.
Central Highlands Development Corporation	Coordinates and promote economic development initiatives in the Central Highlands region. Has significant involvement with State and Federal agencies in regional project development.
CHRRUP	Supports sector groups to build a better system of planning to ensure a viable and sustainable future for the Central Highlands, based on greater coordination and negotiation between sectors. Comprised of representatives of 13 sectors.
Cotton Australia	Peak grower body for cotton industry. Represents and advances interests of the industry, concerned with industry standards, environmental management, health and safety and education and promotion.
Department of Natural Resources and Mines	Responsible for sustainable natural resource management. DNR&M manages and allocates the State's land, water, mineral and petroleum resources, and manages native vegetation and the control of pest plants and animals.
Department of Primary Industries	Responsible for the industries producing food and fibre to ensure: food integrity; smart, market-driven food and fibre production; ecological, sustainable use of natural resources; innovation and the uptake of new technology by business; and sustainable profitable rural communities.
EPA	Incorporates Queensland Parks and Wildlife Service (QPWS). Key functions include environmental planning, environmental policy and economics, environmental operations with service delivery in Southern, Central and Northern Regions, sustainable industries, environmental and technical services, public affairs, corporate development, and corporate performance and risk.
Fitzroy Basin Association	Regional community group representing a broad range of industries and interests. Developed the Central Queensland Strategy for Sustainability (CQSS). Focussed on communicating and encouraging adoption of best management practices.
Fitzroy Basin Elders Committee	Involvement in regional reconciliation groups, involved in regional capacity building with other sectors. Represented on FBA, CHRRUP. Involved in delivering services to Aboriginal community and managing development issues.
Fitzroy Basin Food and Fibre Association	Represents the interests of the food and fibre industries in the Basin
Greening Australia	Greening Australia aims to engage the community in vegetation management to protect and restore the health, diversity and productivity the Australian landscape. Advisors on vegetation management, they tackle issues like salinity, declining water quality, soil degradation, climate change and biodiversity loss through practical experience, science, community engagement and commitment.
Landcare	Represented in FBA, CHRRUP. Partakes in coordinated regional activity with other sectors. Focussed on raising funds and awareness, and helping governments, corporates and communities become partners in awareness campaigns and environmental repair projects
Local Government	Responsible for local and urban infrastructure, pest management, local shared resources. Represented on FBA, CHRRUP.
Mining Industry	Various participants represent the interests of the mining industry within the region. Engage with State through Queensland Mining Industry Council. Also represented on FBA.
SunWater	Previously State Water Projects, DNR. SunWater owns and operates a regional network of water supply infrastructure that underpins irrigated agriculture, mining, power generation, industrial and urban development
Universities (Central Queensland TAFE, CQU)	Provides strategic regional planning for university services within Central Queensland. Represented on CHRRUP .