



PROTECTING OUR ASSETS

A NATURAL RESOURCE MANAGEMENT PLAN
FOR THE QUEENSLAND SECTION OF THE LAKE EYRE BASIN
(2004 - 2009)

Prepared by
DESERT CHANNELS QUEENSLAND INC.
for
THE COMMUNITY OF THE REGION

November 2004

The Desert Channels Vision:

The Desert Channels Region is valued for its healthy land and rivers, sustainable communities and production and its unique natural and cultural heritage.

The Desert Channels Assets:

Land

Geology, landforms and soils shape and support the pastures and other vegetation that determine the way we can productively use the land.

Water

Aquatic ecosystems and associated catchment processes govern the quality and quantity of water available to support our biodiversity, productivity and communities.

Biodiversity

The rich diversity of our region's living things (from soil microbes to large mammals) supports productive ecosystems that provide us with the natural resources on which we depend.

Community

A well-informed, resourced and motivated community will wisely manage its natural resources, heritage and institutions.

Acknowledgements

Protecting our Assets was prepared on behalf of the community of the region and reflects their values and aspirations. While it has been prepared in good faith, it is not the only source of information on sustainable natural resource management in the Desert Channels Queensland region; people should consult widely before making management decisions.

This document has been developed after extensive consultation with the community, and reviewing the lessons we have learnt from the past.

It will remain a 'living' document, open to change as required.

Protecting our Assets is one of three documents developed to provide comprehensive information on the Desert Channels Queensland region. The other two, *Community Information Paper* and *Communications Plan*, are readily available from Desert Channels Queensland (see bottom of page) and should be used to support this document.

The preparation of this plan would not have been possible without the support of the community of the Desert Channels Queensland region. Despite adverse seasonal conditions and competing demands on their time, the people of the region have responded wholeheartedly.

An undertaking of this scope could not be done justice without competent technical input and guidance. The generous contribution by members of our technical teams to this plan and the preceding workshops is appreciated.

Because of the special geographic relationship we share with our sister regional body, the Rangelands Integrated Natural Resource Management Group in South Australia, this plan has similar structure and some common content with their plan. The Rangelands Integrated Natural Resource Management Group's willingness to share the content of two tables, as well as the structure of their asset tables, is indicative of the goodwill and partnership approach to natural resource management across the Lake Eyre Basin.

Also critical to the development of this plan has been the valuable support, input and guidance of Queensland and Australian Government agency people.

We can only complete this journey together and together we have taken the first steps.

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Summary

The community of the Desert Channels region - the Queensland section of the Lake Eyre Basin - has come together to develop a plan to sustainably manage its natural resources. *Protecting Our Assets* is about identifying the key threats to our natural resources and coming up with targets and actions to deal with these threats over the next five years.

This plan involves the Desert Channels community, through the Desert Channels Board, and its implementation groups (Desert Uplands Build-Up and Development Strategy Committee, Cooper's Creek and Georgina Diamantina catchment committees) working in partnership with the State and Australian Governments to deliver natural resource management (NRM) outcomes for the region. Funds from the Natural Heritage Trust¹ and Queensland Government will be focussed on protecting our biodiversity, the sustainable production from our land, and providing opportunities for the community to improve their skills to manage the natural resources of the region.

The plan identifies four assets:

- Land
- Water
- Biodiversity
- Community

Threats to these assets have also been identified. These threats may take some time to deal with and will require the commitment of large sectors of the community. Some grazing practices are unsustainable; they have been present since the early days of European settlement, and have been gradually impacting on the region's assets. Other threats, such as the spread of invasive weeds, are more immediate.

Our knowledge base on these assets, in line with the vast area of the region, is quite modest. The plan identifies areas where access to information, or better information, is required if we are to put in place meaningful targets for the management of the region's natural resources.

The community has prioritised proposed actions against each of the region's assets. These actions will be dealt with in the development of the Regional Investment Strategy and will be rolled together into integrated investments that will demonstrate value for our investors. Our best investments will be those that deliver a good return by reducing the threats to our assets, are achievable, and provide a positive impact on our community.

This is not the first time the community of the region has been involved in the development of natural resource management (NRM) plans. The Desert Uplands community developed an NRM plan² for their area in 1999. The Lake Eyre Basin Coordinating Group and the Cooper's Creek and Georgina Diamantina catchment committees released strategic plans in 2000³. This document not only builds on the work

¹ A body established by the *Natural Heritage Trust of Australia Act 1997* to stimulate conservation, sustainable use and repair of Australia's natural environment.

² Desert Uplands Natural Resource Management Plan

³ These three plans were released separately and as a combined document, 'a future for all – Strategic Plans for the Lake Eyre Basin'.

of these earlier plans but fulfils the community's request for commonality between it and the plan of our cross-border, downstream, sister organisation, South Australia's Rangelands Integrated Natural Resource Management Group.

The community of the region has also been involved in developing water and vegetation management plans which, although a State responsibility, have links to this plan.

Protecting our Assets is the first time the whole of the Desert Channels region has come together to develop a target-based NRM plan that will feed into an investment strategy. Desert Channels Queensland Inc. (DCQ) is a young organisation and this is a first generation plan. This plan is a living document; circumstances and issues will change; this plan will be adapted accordingly.

We will not be able to do everything the community wants. The region is vast; the available resources are finite. Nonetheless, this plan is aimed squarely at moving our region forward to our vision of protecting our healthy land and rivers, our sustainable communities and production, and our unique natural and cultural heritage.

Note: The information contained in section 2, 'The Desert Channels Region' is a summary from the *Community Information Paper* (CIP). The CIP and the *Communications Plan* are support documents to this plan and can be accessed at www.dcq.org.au or from the address at the bottom of page 3.

Part A - Background to Planning

1. Introduction - who are we, where are we, and what are we doing?

Desert Channels Queensland Inc. (DCQ) is the designated regional body for the Queensland section of the Lake Eyre Basin. It is a community-based natural resource management body with board members nominated from a range of interest groups in the region. It covers more than 500,000 sq kms or around 30% of the State making it Queensland's largest regional body area.

As part of the Lake Eyre Basin, the region drains internally and not to the sea. It is recognised for its diverse landscapes which range from the forest covered mountains of the Great Divide to the dunefields of the Simpson Desert. The largely intact ecosystems, free flowing rivers and significant wetland areas are the essence of the outback, as is the heritage of the Indigenous people and the pastoral industry.

The scattered 14,500 inhabitants are stewards of a vast landscape rich in natural and cultural heritage, and immensely productive for pastoralism, mining, petroleum and tourism.

As the designated regional body, for the purposes of the Natural Heritage Trust, DCQ is responsible for developing a Regional Natural Resource Management Plan and a Regional Investment Strategy. This plan, over the next five years, will guide investments from the Australian and Queensland governments, and other funding sources, to tackle the key natural resource management (NRM) issues of the region.

The business of this plan is developing a vision and strategies to sustainably manage and protect the natural resources of some of Australia's most productive rangelands. It provides the community of our region with the opportunity of making the most of the Natural Heritage Trust 2 funding from the Australian and State governments. This can provide funding for a range of investments to protect our biodiversity, maintain sustainable production and improve the skills of our community.

In *Protecting Our Assets*, the community recognises that significant challenges to managing our natural resources exist, even in a relatively pristine region such as Desert Channels. Some of the issues we face are:

- Threats from invasive weeds and feral animals;
- Ensuring sustainable management of land and water in the face of some of the highest climate variability on the world's driest continent;
- Understanding our biodiversity;
- Protecting our natural and cultural heritage from visitor pressure.

Getting effective community involvement in NRM is the challenge. With 66% of our population living in towns, there are only around 5000 people, thinly scattered, across the rest of the landscape. This plan seeks to ensure that appropriate skills get out into the community and supports greater participation in natural resource management.

In the past, with our NRM efforts, we have tended to focus on single issues with less than ideal results. Planning has not always been approached in an integrated way nor have enduring partnerships been developed to get the most effective results.

Measuring the results has also not been a priority. This is the first target-based, integrated NRM plan developed for this region.

A significant priority for the planning process has been to maintain the momentum and goodwill of the Lake Eyre Basin community process which has been underway for almost ten years. A major outcome of that process is the way different sectors of the community have come together to make joint, consensus-based decisions on the management of the Basin's natural resources.

Another important outcome is the Lake Eyre Basin Intergovernmental Agreement, initially between the Queensland, South Australian and Australian Governments but lately expanded to include the Northern Territory (see Part C for more detail).

Figure 1: Lake Eyre Basin Agreement area



In developing this plan, Desert Channels Queensland has liaised closely with the South Australian Rangelands Integrated Natural Resource Management Group⁴ (RINRMG) and the Landcare Council of the Northern Territory. In keeping with the wishes of the Basin community, the plans for both DCQ and RINRMG share similar structures. A section on cross border issues in this plan outlines the extent of this collaboration.

Funding will always be an issue; we must be realistic and recognise it will be limited. There will never be a pot of gold at the end of the rainbow for every NRM problem. We must also recognise that our ability to spend NRM funding effectively will be limited by our level of human resources and remoteness.

In many cases simply getting the information to better define the problems will be an important first step of this process.

Developing the Desert Channels Plan has been the first step on a path that has been smoothed by the goodwill and participation of a wide cross-section of the community. The level of commitment and ready sharing of knowledge has been excellent. We recognise that there have been areas, such as Indigenous involvement, where progress has been modest. More time is needed here; the timelines to meet the requirements of NHT2 have been tighter than many in the community feel is realistic.

⁴ The Rangelands Integrated Natural Resource Management Group basically covers South Australia's pastoral leasehold land.

1.1 Purpose of the plan

Protecting our Assets has been prepared to enable the community of the Queensland section of the Lake Eyre Basin to consider options for the sustainable management and protection of their natural resources. It presents a profile of the region, its natural resources and community, and provides a vision for the future, as well as targets and priorities for management actions. This plan should be considered a first generation, living document that will continue to be reviewed and refined in line with experience, changing circumstances and needs.

In keeping with the Natural Heritage Trust 2 guidelines, *Protecting our Assets* focuses on the relevant parts of three key objectives:

- Biodiversity Conservation - the conservation of Australia's biodiversity through the protection and restoration of terrestrial, freshwater, estuarine and marine ecosystems and habitat for native plants and animals;
- Sustainable use of Natural Resources - the sustainable use and management of Australia's land, water, and marine resources to maintain and improve the productivity and profitability of resource-based industries;
- Community Capacity Building and Institutional Change - support for individuals, landholders, industry, and communities, with skills, knowledge, information, and institutional frameworks to promote biodiversity conservation and sustainable resource use and management.

In concentrating on these objectives the plan seeks to deal with causes rather than symptoms. It is far better to nip something in the bud than let it get to the stage where much greater resources are required. An investment in weed awareness and targeted control, for example, may prevent a weed becoming established in the region and be a much smaller cost than a large-scale assault on a well-established and widespread weed.

1.2 Benefits of natural resource management planning

The regional NRM process offers an opportunity for a range of interested parties to come together to determine the NRM priorities and associated actions for the Desert Channels region. In seeking the resources to implement priority actions, the community must be prepared to negotiate resource⁵ allocation from the State and Federal governments, develop partnerships⁶ to get the job done, and be able to measure what those priority actions achieve (the outcomes).

Integrating planning at the national, state and local level makes it more likely that proposed actions will be undertaken in the most strategic and efficient manner. The business is not just about the best use of resources, but also about looking at overcoming impediments to the community adopting improved practices. These may be, for example, management of pastures and weeds on a pastoral enterprise, or efficient use of water and environmentally sound disposal of waste by town communities.

⁵ Resources are not only funds but things like in-kind support and partnerships.

⁶ These could be with industry, local government, organisations or government itself.

This plan identifies that threats exist to all the natural assets of the region. It also recognises that not all threats can be dealt with in the short term or within the likely resources. This plan seeks to prioritise actions that will provide the best return for the resources invested.

A significant level of awareness of NRM issues in the region has already been established. This has occurred through the Landcare movement since the early 1990s and the debate over World Heritage listing and large-scale irrigation in the region in the mid 1990s. Proposed World Heritage listing led to the development of the community-based NRM initiative of the Lake Eyre Basin Steering Group and, ultimately, the Lake Eyre Basin Coordinating Group. The irrigation debate triggered water management planning in the region.

The move towards sustainable use of our natural resources is a significant challenge for the Desert Channels region, but not an impossible one. The spread of weeds, if not tackled, has the potential to substantially reduce carrying capacity⁷. The control of feral animals, if not undertaken in a strategic way, may considerably reduce the options for grazing enterprises in the future.

On the other hand, the future benefits of a healthy region through clean and green marketing of livestock and wild game products, along with ecotourism, are potentially significant. Ensuring that the community gets the maximum value from these opportunities, in an environment where long-established land-uses such as wool production are in decline, is also a challenge.

1.3 What might happen if we did not take action?⁸

Despite the acknowledged good condition of many of our region's assets there are a number of threats to the region that cannot be ignored. Many of these are common to other rangeland regions in Australia; others are more specific to this region. A few examples are:

- Weeds
- Climate change
- Lack of knowledge
- Feral animals
- Unmanaged tourism

Weed threats, through the spread of several Weeds of National Significance from the north of the region, are major. Most of these weeds have the potential to significantly extend their range downstream in the catchments. Prickly acacia, for example, based on climate data alone, can potentially extend its range from less than a third of the region to almost all the region [ref 12].

Not acting on these threats could significantly reduce pasture yields and biodiversity in a large area of the region, particularly the Mitchell Grass Downs - some of Australia's most productive rangelands. When these weeds become established, the potential cost

⁷ The capacity of land or pasture to support livestock.

⁸ This section deals with the major natural resource management challenges of the region and how these link to the community: more detailed socio economic information can be found in the DCQ Community Information Paper.

of eradication is many times the value of the land, and beyond the resources of most landholders.

Biodiversity is regarded as generally in good condition in the region but there are significant gaps in information. We do know that a number of species of mid-sized marsupials have either become extinct or have had their range reduced significantly over the past two centuries. Not acting on threats to endangered species like the bilby (*Macrotis lagotis*) and kowari (*Dasyuroides byrnei*) will consign them to history.

Artesian springs are islands of biodiversity that, in total, only cover a few square kilometres of this vast region. We are only just learning about their diverse ecology and the unique range of endemic species they support. If our community does not gain the skills needed to manage these fragile areas, a significant part of our biodiversity may be lost as has already occurred in other parts of arid Australia.

An effective way to ensure biodiversity loss is minimised is to integrate an understanding of the role of biodiversity in the broader landscape into the management of grazing land. If we cannot provide access to this information in a way that land managers understand and accept then we have lost one of the best opportunities to deliver biodiversity conservation to the region.

Sustainable pasture management is one of the biggest NRM challenges given that pastoral production is by far the largest land-use and economic driver across the region. We know we have some of the most variable rainfall in Australia and global warming is expected to increase this variability [ref 8]. How climate change will effect us needs to be better understood if the pastoral community is to manage the challenges ahead.

Recent droughts have raised issues about the long-term sustainability and response to drought of two major native pasture types in the region, Mitchell grass and spinifex. The long-term sustainability of the main introduced pasture plant, buffel grass, has also been questioned.

Our information on many of our pasture types is quite good; making this available to landholders, in a useful form, is the challenge. The best opportunity to get this information out to the land management community is in training packages being developed. This plan identifies the Grazing Land Management⁹ training package as having the greatest potential in this area.

Grazing Land Management (GLM) is tailored to a particular land type such as the Desert Uplands or the Mitchell Grass Downs. It delivers an integrated property management package incorporating a wide range of best management practice information. This includes pastures, livestock, pests, vegetation, biodiversity and fire. This type of information is aimed at improving the pastoral community's economic viability as well as their ability to sustainably manage their natural resources.

⁹ Developed by Department of Primary Industries and Fisheries in partnership with Meat and Livestock Australia.

Vegetation management is recognised as a significant issue across the region, particularly in the east where major community concerns are:

- managing vegetation thickening in woodlands;
- managing shrub and tree encroachment into open grasslands;
- managing regrowth from clearing;
- restoring endangered ecosystems or vegetation in areas inappropriately cleared;
- promoting the regeneration of tree and shrub species which are in decline because they are palatable to stock.

Water management is also a significant area of community concern. From time to time it has divided our community between those seeking to protect catchment flows and those who see potential for further development.

Promoting best practice rural and urban water-use is seen as a key opportunity for the community to protect the value of both surface and underground water resources. This would support the emphasis on protecting environmental flows expressed by the community through the water management planning process undertaken by the Department of Natural Resources and Mines in the Cooper and Georgina Diamantina catchments.

The water planning process also highlighted a number of key activities in regard to information gathering which included floodplain and wetland processes, and monitoring environmental condition and water quality. A better understanding in these areas enhances our ability to sustainably manage the water resources of the catchment.

Community is the glue that binds it all together. The small population of the region, although remarkably resilient, has faced significant threats over the past decade. These have included two severe droughts coupled with low commodity prices. Poor returns for sheep enterprises, along with wild dog control problems, have seen a widespread change in land-use from sheep to cattle. This shift is placing significant pressure on employment opportunities and, when coupled with drought's impact on wild game harvesting, has seen many smaller centres suffering population decline. This trend is predicted to continue¹⁰. There is a risk that we may no longer have enough people on the land to effectively manage our natural resources.

Economic pressures from hard times along with recent rural land speculation can encourage short term decision-making aimed at immediate cash return rather than long-term sustainability. There are an increasing number of landholders who may not have a long-term interest in the land.

Emerging industries such as service industries and tourism have helped offset these economic pressures, but the benefits have not been felt in all areas. Furthermore, the rapid expansion of outback tourism, often based on bush camping around permanent waterholes, is causing significant damage to riparian vegetation, water quality and fish stocks. Although local government sees tourism as an economic opportunity, it often lacks the skills to effectively manage the impacts. In many cases, the very thing people are coming to see could be damaged beyond repair in a few short years. Unmanaged tourism is increasingly being identified by the community as major sustainability issue.

¹⁰ Australian Bureau of Statistics

Failing to address some of the key impacts on sustainability will only exacerbate this shift in population and may ultimately result in a critical lack of skills and labour to do the jobs required. The number of people outside of towns is declining, even in shires that have shown population growth. The landholder community is coming under increasing stress and is less able to be involved in community processes. This shows up very strongly in elected representatives in local government. Only ten years ago most councils had good representation from rural areas; today many are almost entirely townspeople.

1.4 How to read this plan

The Desert Channels plan is in five parts.

Part A - Sets the scene

It deals with the background to the plan, why we are doing it, and provides an overview of the region, its landscape, natural resources, community and economy. It also deals with how the regional NRM planning process was undertaken and how it fits in with other planning processes.

Part B - Is the key part of the plan

This part looks at the assets of the region: land, water, biodiversity and community. It sets the condition we want these assets to be in by a certain time, along with the actions we can undertake to achieve this. Community priorities in managing natural resources were combined with technical information on threats to our assets to come up with the areas for action.

Part C - Deals with cross-border arrangements

It looks at how we have interacted with our neighbouring, interstate NRM bodies, the Landcare Council of the Northern Territory upstream in the Lake Eyre Basin, our sister organisation downstream, the Rangelands Integrated Natural Resource Management Group of South Australia, and the Western Catchment Management Authority in New South Wales.

The cross-border actions of Queensland and South Australia are shown in a table common to both plans. This cross-border collaboration supports the Lake Eyre Basin Agreement between the Australian, Queensland, South Australian and Northern Territory governments.

Part D - Implementing the regional plan

This section deals with how the priorities for investment, to go into the Regional Investment Strategy, were determined. It also deals with where the resources will come from to make the plan happen.

Part E - How do we measure our progress?

This looks at how we put in place the processes to measure the outcomes of the proposed investments.

2. The Desert Channels region

The following information presents a brief profile of the Desert Channels region, its natural resources and community. For more detailed information, see the Community Information Paper at www.dcq.org.au

2.1 An overview

The Desert Channels Queensland (DCQ) region is the Queensland section of the Lake Eyre Basin. Its 509,900 square kilometres make it the largest regional body area in Queensland. The region is made up of the Georgina Diamantina and Cooper Creek catchments¹¹ which are the main catchments for Lake Eyre. The region contains wetlands of international significance and national importance,¹² and the biodiversity hotspot, the Desert Uplands bioregion¹³.

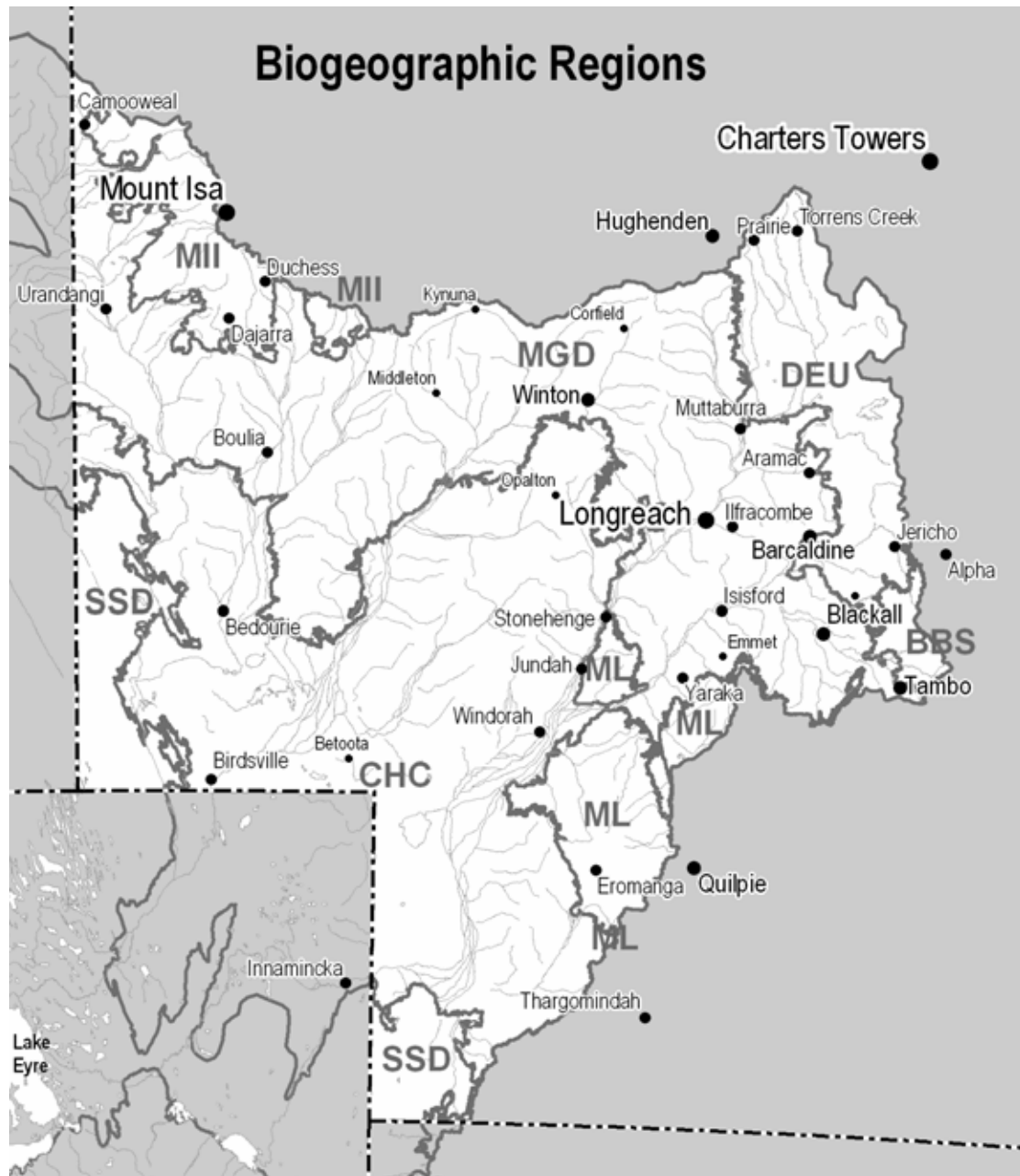
The DCQ region, with seven biogeographic regions (see map), is the most diverse in the state. It ranges from the eucalypt woodlands of the Desert Uplands along the Great Dividing Range, through the rolling plains of the Mitchell Grass Downs and the vast floodplains of the Channel Country to the Simpson/Strzelecki Dunefields. Also represented are the ranges of the Mount Isa Inlier, significant areas of the Mulga Lands and a small part of the Brigalow Belt South.

¹¹ The Georgina Diamantina catchment has 99,800 sq km in the NT, 263,100 sq km in Qld and 42,200 sq km in SA. The Cooper catchment has 243,800 sq km in Qld, 600 sq km in NSW and 53,200 sq km in SA. (figures have been rounded to the nearest 100 sq km)

¹² Wetlands of national importance are listed as Appendix 4 in the DCQ Community Information Paper.

¹³ In October 2003, the Desert Uplands was declared one of Australia's 15 'biodiversity hotspots'. Further information is available in Section 2.4 – Biodiversity (Environmental Values), the Community Information Paper, and at <http://www.deh.gov.au/biodiversity/hotspots/index.html>

Figure 2: Biogeographic Regions



Key: BBS = Brigalow Belt South; CHC = Channels Country; DEU = Desert Uplands; MGD = Mitchell Grass Downs; MII = Mount Isa Inlier; ML = Mulga Lands; SSD = Simpson/Strzelecki Dunefields

The major land-use, the rangeland grazing of cattle and sheep, sustains a decreasing rural population. Town communities increasingly rely on tourism, government and other service industries.

Natural resource management issues, as identified by the community, centre on: enterprise sustainability; and management of pastures, vegetation, water, weeds and feral animals.

2.2 Land

Geology

The Lake Eyre Basin is an ancient, weathered landscape.

The 1800 million year old rocks on the northwest edge of the region are some of the most mineral-rich rocks in the state and support a significant mining industry. The rest of the DCQ region is a series of vast sedimentary basins, much of it underlain by the sediments of the Great Artesian Basin. The oil and gas rich Eromanga and Cooper basins underlie the southern part of the region.

Elevations range from 850 metres above sea level at White Mountains in the northeast down to the 15 metres above sea level in the beds of salt lakes in the Simpson Desert near Poeppel Corner.

Soils

Soils are quite varied: from the dune sands of the Simpson Desert; through grey and brown clays of the Mitchell Grass Downs; heavy grey clays on the flooded areas of the Channel Country; to the duplex soils, red earths and sands of the Desert Uplands and the Mulga Lands.

The heavy clay soil of the Mitchell Grass Downs has traditionally been seen as the most valuable land because of heavier grass cover due to greater fertility and moisture retention. Lighter, sandy soils are generally less fertile and can store less moisture, but can show pasture response to lighter rainfall.

There has been little cropping undertaken in the region. The suitability of soils to support improved pastures, particularly in eastern parts where buffel grass has been introduced, has been the focus of discussion.

While there is limited information on salinity (no risk/hazard assessment mapping), it is part of the landscape; much of the area was once submerged by sea. It is generally believed that the present, largely remnant (97% of the region) vegetation has evolved to cope with these salinity levels.

Erosion is undoubtedly a natural part of the landscape. The extent to which this has been influenced by land management practices is debatable. While there has been no assessment at the regional scale, studies of parts of the region indicate potential for water erosion in the Desert Uplands and wind erosion of the Channel Country soils. The Mitchell Grass Downs soils are regarded as comparatively stable [ref 28, 29].

Poorly sited roads and tracks and inappropriate construction techniques, borrow pit location or inadequate rehabilitation contribute to significant erosion problems. Although it is acknowledged that resources available in this area are modest, there is a clear need to adopt better management practices. This applies to property tracks, as well as shire and main roads.

Although the lands of the region are regarded as being in 'reasonable to good' condition [ref 14], areas have suffered from the impacts of changed land-use. Examples can be found along once heavily-used stock routes and around watering points both man-made and natural. There are concerns, both in the pastoral and scientific community, about the potential for long-term overgrazing to gradually degrade large areas. This can

result in soil loss, changing vegetation composition to less desirable species, and the establishment of weeds, all of which reduce productivity and conservation values.

Climate

The typically hot, dry climate has highly variable, predominantly summer rainfall, usually associated with trough systems. Monsoonal or cyclonic influences can deliver significant rain events in the north but these are rare further south.

Temperatures range from -2°C to 49°C and rainfall averages from 165 mm at Birdsville to more than 600 mm in the White Mountains [ref 6].

Most of the catchment experiences more than 2.8 metres of evaporation per annum with extremes of up to 4 metres in drought years.

While the flora and fauna are adapted to irregular rainfall and flooding events, the highly variable climate is one of the major challenges for both the pastoral industry and town communities.

The impact of global warming may place additional stresses on the productivity and ecology of the region. Predictions of significant moisture deficits, with even small (1-2°C) rises in temperature, are of concern [ref 5].

Indigenous land management

Aboriginal people came to the Australian continent more than 60,000 years ago and have been living in the DCQ region for at least 17,000 years. The region is dotted with sites showing evidence of their presence and way of life. Sites along the southern parts of Cooper Creek have been dated at about 12,000 years old.

The Aboriginal population of the region is modest compared with many other parts of outback Australia. It is estimated at around 6.3%, with most of these people living in the west. The Indigenous population of the Georgina Diamantina catchments, with significant communities at Dajarra and Urandangi, is around 15%. In the Cooper catchment there are around 3.4% Indigenous people and no major communities [ref 2].

Today, Aboriginal people, through their affinity with country, are seeking to be involved with land management. The Simpson Desert National Park, one of the largest in Queensland, has been declared a National Park (Aboriginal Land) jointly managed by Queensland Parks and Wildlife Service and the traditional owners.

Recognition of Native Title has provided many families with, not only the rights to their country, but also the capacity to negotiate over the future of that country. To date, some 24 Native Title claims covering around 50% of the DCQ region have been made, mostly in the west and north.

Encouraging the contribution of Indigenous people in managing the natural resources of the region will be a key part of the regional planning process. Desert Channels has engaged an Indigenous/Landcare facilitator to help progress Indigenous involvement.

European settlement

Charles Sturt, Thomas Mitchell and Edmund Kennedy all explored into the region in the mid 1840s, but it was those sent to look for the ill-fated Burke and Wills expedition of

1860 who discovered an expanse of new pastoral country in the Mitchell grass downs [ref 13] along with the Channel Country's verdant flooded pastures.

Rural settlement in the region began with vast holdings, later broken up with the aim of promoting closer settlement. The development of the region for wool production brought the need for a substantial labour force, and towns and settlements sprung up as the railway line extended west to Barcaldine in 1886 and Longreach in 1892.

Barcaldine was the scene of one of the most significant events in the political life of Queensland when, as a result of the Shearer's Strike of 1891, the Labour Electoral League was born (this and other colonial Labour Leagues ultimately amalgamated to form the Australian Labour Party).

Jackie Howe shored 321 sheep at Alice Downs near Blackall in 1892, *Waltzing Matilda* was penned by Banjo Patterson at Dagworth Station near Kynuna in 1895 and, in 1920, Qantas was founded in Winton.

The period between the wars saw closer settlement. In the west and south, holdings did not change much in size. However, in many parts of the downs country the larger holdings were broken into sheep blocks of 20,000 or even 10,000 acres, which at that time could sustain a family. In the past decade this pattern has swung the other way with a strong move towards cattle and the aggregation of properties.

The region is home to many well-known icons of Australian outback life that increasing numbers of tourists are coming to see. The Waltzing Matilda Centre in Winton, Australian Stockman's Hall of Fame in Longreach, Australian Workers Heritage Centre in Barcaldine and Blackall Woolscour are popular stops along the Matilda Highway. Further west tourists now travel throughout the Channel Country each winter and flock in thousands to events such as the Boulia Camel Races and the Birdsville Cup.

Land tenure

There are three main land tenure types in the region: Pastoral Holding (Term Lease - Pastoral Purposes); Grazing Homestead Perpetual Lease (GHPL) and Freehold.

By area, Pastoral Holdings dominate, particularly in the west and in parts of the Desert Uplands. Perpetual leases are most common in the Mitchell grass downs with a significant area of freehold in the Barcaldine to Tambo area. The rate of freeholding of perpetual leases has slowed considerably in recent years as costs have risen and rights to manage vegetation have changed. There is little difference in the value of perpetual lease land and freehold land in the region.

The *Draft State Rural Leasehold Land Strategy* was released in 2003 and is expected to be finalised in late 2004. This policy provides a framework for achieving sustainable management and use of state rural leasehold land by protecting its environmental, social and economic values, and recognises the various interests held in it. The approach of the strategy is to encourage stewardship through performance-based incentives, which are proposed to be linked to certainty and security of tenure [ref 23].

This strategy has also dealt with the issue of diversification of enterprises into non-traditional areas such as cropping, horticulture and aquaculture. In response to poor commodity prices there has been significant interest in diversification away from traditional grazing. This interest has waned in the last few years with the increased returns and strong growth of the cattle industry.

Stock routes

Approximately 12,000 kilometres of primary, secondary and inactive stock routes traverse the DCQ region. Although these corridors, which can be a mile wide, are now being valued for their heritage and nature conservation values, many are still being actively used for droving. Many are also grazed by the property through which they run.

Droving large mobs from breeding properties in the north and the NT to fattening properties in the channel country, or delivery to sales or meatworks, is still a common practice by the larger pastoral companies. During the 2001-2004 drought, large numbers of cattle went on the road looking for grass. Drivers used water tankers for sections where water facilities were scarce, and lick trailers to better utilise pasture.

Managing the stock routes of the region is one of the major NRM challenges for local government. During 2004 all of the region's shires will be developing Stock Route Management Plans to meet the requirements of the *Land Protection (Pest and Stock Route Management) Act 2002*.

Pasture communities

Five major native pasture types exist in the DCQ region: Mitchell Grass, Spinifex, Channel Country, Mulga, and Gidgee.

Mitchell grass is among the most extensive and valuable of Queensland's native pastures. These perennial grasses grow on heavy textured clay soils, are long-lived and drought resistant, and have high livestock carrying capacity compared to other native species.

Spinifex is a dense slow-growing, hummock-forming perennial grass, green for much of the year and seeds in response to rain. In less fertile, sandy soils such as parts of the Desert Uplands spinifex often makes up the major pasture species available to grazing animals.

The resilience of Mitchell grass and spinifex pastures has been tested by the recent (2001 to 2004), severe drought. Community concerns about the ability of these pastures to regenerate have prompted field research led by the Department of Primary Industries and Fisheries. The research has been complemented by work by the same agency on the potential impact of climate change on the region's pastures (ref 5).

The floodplain areas of the Channel Country produce abundant pasture growth when floodwaters recede and are dominated by shallow-rooted annual herbage, notably Cooper clover, and grass species, and support deep-rooted perennial shrub species such as Queensland bluebush and Lignum.

Both the mulga and gidgee pasture communities have seen changes driven largely by grazing and fire management practices. Mulga communities grow on sandy loam soils and are generally a mix of perennial tussock grasses like mulga Mitchell, mulga oats and umbrella grass. Competition from invading native woody shrubs like turkey bush severely depletes these palatable pastures.

The hard, pebbly soils that support gidgee communities are mostly heavy clays. This pasture type is mainly chenopods, annual grasses and herbs with areas of sparse Mitchell grass. In many parts, mass seedling growth triggered by extremely wet seasons has transformed open woodlands into thick scrub to almost total exclusion of pasture species.

Vegetation management

An estimated 3.2% the DCQ region has been cleared, mostly acacia and eucalypt woodlands in the east. The subsequent pasture development has often been with introduced grasses such as buffel (Rodgerson pers comm.).

Vegetation encroachment (from seedling growth) into open woodlands or grasslands is a significant issue in both eucalypt and acacia Regional Ecosystems in the Mitchell Grass Downs and Desert Uplands bioregions.

Draft Regional Vegetation Management Plans for the seven bioregions that cover the region were developed and released in 2003. This process has been overtaken by the passage of the *Vegetation Management and Other Legislation Amendment Act 2004*. Under the new vegetation management framework there will be a ban on the broad-scale clearing of remnant vegetation in Queensland from the end of 2006. Remaining areas of Regional Ecosystems available for clearing have been calculated at the bioregional level. These are subject to an application by ballot, which closed at the end of August 2004. Applications for clearing under this new Act must meet performance requirements outlined in Regional Vegetation Management Codes based on the Regional Vegetation Management Plans.

Other aspects of the vegetation management framework include provisions for compensation and incentives for best practice management of native vegetation.

Provision for continued treatment of vegetation through Regional Ecosystem maintenance provisions (thinning), treatment of regrowth, fodder harvesting, and other management activities can still occur after 2006 but will be subject to permit application.

Pest management

The control of pest animals and plants is one of the major natural resource management issues for the DCQ region. Given the relatively sparse population and small resources, it is imperative that there is high awareness and that control efforts are timely and strategic. Pest plant infestations and threats are more centred on the north and east of the catchment whilst feral animal impacts are felt more widely.

Known pest plants include the Weeds of National Significance: prickly acacia, parkinsonia, mesquite, rubber vine and parthenium weed. Other weeds of regional significance are noogoora burr, Bathurst burr, mother of millions and Mexican poppy. There are also weeds of local significance like coral cactus, devil's rope pear, snake pear, balloon vine, florestina, lippia weed, bellyache bush, mother-of-millions, chinee apple, leucaena, African love grass, thornapples and lion's tail.

Giant rat's tail grass, water lettuce, giant sensitive plant, neem, calotrope, water hyacinth, Quilpie mesquite and salvinia are not present, but have the potential to become established in the region.

A number of weed management groups provide leadership in the region. These include, at a national level, the National Prickle Bush Management Group which deals with prickly acacia, parkinsonia and mesquite, the National Rubber Vine Weed Management Group, and the Parthenium Weed Management Group. Desert Channels Queensland actively supports the Shire Rural Lands Officers Group of Western Queensland which leads the

work in pest management in the region. Landcare groups are also active in supporting landholders in controlling weeds.

Pest animals established in the region include: dingoes (wild dogs), foxes, cats, rabbits, pigs, goats, deer, cane toads, horses, donkeys and camels.

The 'Chemical Barrier' which prevents incursions of wild dogs into the sheep country in the east of the region is one of the largest baiting campaigns in the state, with up to eight baitings each year. Shires in this part of the region are actively collaborating in the development of best practice wild dog control techniques in partnership with NR&M. The cost of this control exceeds \$100,000 per annum in some shires.

Failure to control wild dogs, coupled with the decline in the sheep industry, has seen a major land-use change in the eastern parts. This shift from sheep to cattle has significant socio/economic¹⁴ and natural resource management consequences as the number of people working the land declines.

The DCQ region is also a primary breeding ground for the Australian plague locust which often erupts into the cropping areas of Queensland and New South Wales. The control of this pest rests with the landholder, assisted by the State and local governments. The Australian Plague Locust Commission manages outbreaks that are considered to be an interstate threat.

Control of pest plants and animals is a significant part of local government business. During 2004 all shires in the region will be developing new Local Government Area Pest Management Plans as required under the *Land Protection (Pest and Stock Route Management) Act 2002*.

2.3 Water

Most natural surface water is found in the waterholes along the river systems, some of which have never been known to go dry. Other significant natural surface water is the artesian spring pools and streams of the Aramac and Boulia areas.

Artificial surface water storages such as earth tanks or dams are an important water source for the pastoral industry. This water is either pumped from waterholes or captured from streams or overland flow.

Across the region there are now more than 6,000 shallow bores tapping into aquifers above or outside the Great Artesian Basin (GAB). Water quality in these bores is quite variable and generally lower than from the GAB. More than 800 bores in the region have been drilled into the deeper, GAB aquifers. When first drilled, some flowed freely at rates up to 80 litres per second, but in general, most now flow at less than 10 litres per second [ref 16]. Bore capping and piping has seen an increase in local pressures; some bores that had ceased flowing have now resumed. This initiative has been widely supported in the community.

¹⁴ See DCQ Community Information Paper for more detail.

The Great Artesian Basin Strategic Management Plan 2000 provides a framework for the management of GAB groundwater and related natural resources in the whole of the Great Artesian Basin¹⁵. Activities in Queensland are funded jointly by the Australian and Queensland Governments through the Great Artesian Basin Sustainability Initiative (GABSI).

The major water users in the region are the pastoral industry and urban centres, followed by mining and petroleum. Irrigation in the region is limited but adds value through helping to support stud stock, cattle backgrounding¹⁶, drought feeding, and the maintenance of the instructing herd at the Longreach Pastoral College. The majority of irrigation enterprises are reliant on water from the GAB [ref 16].

There has been a Water Management Plan for Cooper Creek in place since 2000. The development of this plan was hastened by applications to extract water from Cooper Creek near Windorah for a planned cotton growing enterprise which was ultimately not allowed to proceed. There was significant community opposition to the scale of the proposed extraction based on concerns over the impacts of diminished flows on ecosystems and downstream floodplain grazing. The current Water Management Plan does not make allowance for any new irrigation development [ref 18].

The water management planning process for Cooper Creek highlighted community concerns about the decline in gauging stations on the system. In response to this the State Government recommissioned 3 gauging stations¹⁷ in this catchment in 1999. A commitment has been made to install a further 3 gauging stations across the region in 2004/2005.

A Water Resource Plan for the Georgina Diamantina was released in August 2004. It sets out the framework for water allocation across the catchment but is less specific than the Cooper Plan on the purpose water may be used for [ref 21]. A Resource Operations Plan which outlines the details of how water may be taken will be developed for the Georgina Diamantina by 2006.

Overland flow has been a contentious issue in the region and the Georgina Diamantina plan makes provision for its regulation. The Water Management Plan for Cooper Creek did not. However a moratorium on the diversion of overland flow for purposes other than stock and domestic in the Cooper catchment was declared in early 2004.

Water quality monitoring in the region to date has been limited. The Lake Eyre Basin streams in Queensland are regarded as having low visual clarity due to suspended clay sediments, with nutrients varying across the catchment. The Thomson, Barcoo, Cooper, and the mid Diamantina have higher phosphorus levels and lower nitrate levels than the Georgina and lower Diamantina. This trend has been reflected in the water quality sampling done by South Australia in the lower Cooper [ref 4]. In general, in-stream nutrient levels measured at those sites would not impact on aquatic health or the use of water for stock and domestic purposes (Bailey pers. comm.).

¹⁵ The Great Artesian Basin underlies 1.7 million square kilometres of mainly Queensland, but also much of South Australia, northern New South Wales, and south-east Northern Territory.

¹⁶ Getting cattle to the required feedlot entry weight.

¹⁷ Bowen Downs on Cornish Creek, Stonehenge on the Thomson River, and Retreat on the Barcoo River.

Catchment processes

The shallow gradients, variable stream flows and flow patterns make the streams of the Lake Eyre Basin unique. Unlike most other rivers, they reach their maximum mean flows around the middle of the catchment instead of their discharge point. The Cooper system reaches an average annual flow of around 3,320,000 megalitres¹⁸ at Windorah, but by the time the flows spread across the floodplain less than a third of this, on average, reaches Nappa Merrie near the South Australian border [ref 17].

This immense variability in stream flows drives the ecological responses and pastoral production of the lower Cooper. Maintaining near natural flows in the catchments has been the focus of the cross-border arrangements of the Lake Eyre Basin Agreement (see Part C for more detail).

Rivers in the Queensland section of the Lake Eyre Basin are the major contributors of inflows to Lake Eyre. An estimated 40% of the water that enters SA is contributed by Cooper Creek and 60% by the Georgina and Diamantina [ref 16].

Aquatic Ecosystems

The health of streams in the Desert Channels Queensland region is in keeping with its relatively undisturbed catchments, unregulated rivers and near natural flows. Land use is mostly extensive grazing and there is no large-scale water extraction [ref 25].

Wetland ecosystems of the region (in particular the Channel Country) are in near-pristine condition and support exceptional biodiversity, especially waterbird¹⁹ populations and breeding, but also fish. Desert landscapes with biota²⁰ in such good condition and still in such great abundance are rare in our world today. The DCQ region, in its own way, is no less significant than Kakadu and deserving of our care (Jaensch pers comm.).

There are, however, trends in some ecosystems which may indicate decline. The most commonly listed threats are:

- increased habitat fragmentation
- total grazing pressure
- stock watering
- feral animals
- unsustainable water extraction
- weeds; altered fire regimes
- changed hydrology

Many of these threats combine to impact on riparian zones and wetlands areas [ref 25]. Unmanaged tourism is resulting in impacts such as damage to streamline vegetation, inappropriate waste disposal, and depletion of fish stocks at some of the more permanent waterholes in the region. Some of these impacts are most evident in drought when these areas become critical refugia.

¹⁸ 1 megalitre = 1 million litres

¹⁹ For a comprehensive list of waterbirds of the region see the DCQ Community Information Paper.

²⁰ The total animal and plant life of a region.

ARIDFLO (Environmental Flow Requirements for Australian Arid Zone Rivers project) is a major, aquatic ecosystem study recently undertaken in the South Australian and Queensland sections of the Lake Eyre Basin. Fieldwork between 2000 and 2003 focussed on fish, waterbirds and other aquatic life and was aimed at identifying the relationships between stream flows and the ecological responses of aquatic and floodplain ecosystems. The period of survey included significant stream flows in 2000 and a major drought in 2002. Results from ARIDFLO will be published in 2004 [ref 1]. Among other outcomes, they confirm that the floodplain ecosystems of the Channel Country are important on a far wider scale than the DCQ region.

The Lake Eyre Basin Ministerial Forum is developing a methodology for the Lake Eyre Basin Rivers Assessment²¹. This project will assess the health of the streams in the Lake Eyre Basin Agreement area every ten years, with the first assessment planned for 2004.

2.4 Biodiversity

Environmental values

The DCQ region is rich in natural assets; these have shaped the human and natural communities' way of life and underpin local industries. Vegetation and animal populations in the outback function in a boom and bust cycle. The integrity of most of the area is still in place, reflecting that grazing production can positively co-exist with the underlying natural values of the area.

The Desert Uplands bioregion, which straddles the boundary between Desert Channels Queensland and the Burdekin Dry Tropics, is a declared biodiversity hotspot.²² It is home to 22 rare or threatened animals and 29 rare or threatened plants. Water enters the Great Artesian Basin here and there are important artesian spring complexes which contain endemic plants, snails and fish. Ecologically and geologically important wetlands include Lake Buchanan and Lake Galilee.

The DCQ region has 23 (17 Channel Country, 2 Mitchell Grass Downs, 3 Desert Uplands, 1 Mulga Lands) wetlands recognised by the State and Australian governments as being of national significance because of their uniqueness, or value to biodiversity conservation [ref 11]. Subject to available resources, future systematic assessments, in consultation with landholders, would enable updating and revision of this database.

Natural biodiversity provides ecosystems and landscapes with resilience against extreme (local) events, as well as providing useful products and critical services such as pollution breakdown, pest management and nutrient cycling. The challenge is protecting environmental values for future generations through sustainable land management while ensuring economic viability for landholders.

²¹ For further information see www.ea.gov.au/water/basins/eyre.html

²² It is one of fifteen *biodiversity hotspots* across Australia designated under the Commonwealth Government's National Biodiversity Hotspots Program.

Rare & threatened fauna and flora

Parts of the region are significant habitat for rare and threatened plant and animal species²³, and for species of conservation concern.

Some 55 animals (14 mammals, 24 birds, 13 reptiles, 3 fish, 1 amphibians) and 67 plants²⁴ in the region are listed as 'of high nature conservation value' under the *Nature Conservation Act 1992*. They are listed because they are endangered, or vulnerable, of rare conservation status, represent an extension of known range or are a new species. There has been a massive contraction in the distribution of mammals in arid and semi-arid parts of the continent, particularly the small to medium, critical weight range species [ref 25].

There are a total of 21 animals (10 mammals, 6 birds, 1 reptile, 4 fish) and 19 plants²⁰ in the region listed under the *Environment Protection and Biodiversity Conservation Act 1999*.

Even relatively common species, such as some international migratory birds listed under international conventions like the *Japan Australia Migratory Birds Agreement* or the *China Australia Migratory Birds Agreement*, are considered to be of conservation concern. Protection of wetland habitat for these migratory species is crucial in considering conservation planning.

For the majority of the significant fauna and flora species of the planning area it is difficult, given current knowledge, to evaluate the protection provided by current plans. Recovery plans for relevant species need to be linked to targeted management planning. In addition, more investment is needed to better understand the spatial aspects of species distribution and their specific ecosystem and habitat needs. As our understanding of the habitat requirements of these species improves it may be necessary to provide protection from threatening processes that come to light. In some areas this may be in the form of a voluntary change in land management practices.

Threatening processes

Ecological values in the region are generally considered to be in good condition. The most commonly listed threats to the biodiversity and ecology of the region are:

- increased habitat fragmentation
- total grazing pressure
- feral animals
- weeds
- altered fire regimes
- changed hydrology
- climate change
- salinity

²³ See DCQ Community Information Paper for a full list.

²⁴ WILDNET (Queensland Environment Protection Agency Database 2003)

These are broad-scale impacts with the first five generally connected to the pastoral industry but urban areas, tourist use, and mining can also impact adversely in more limited areas.

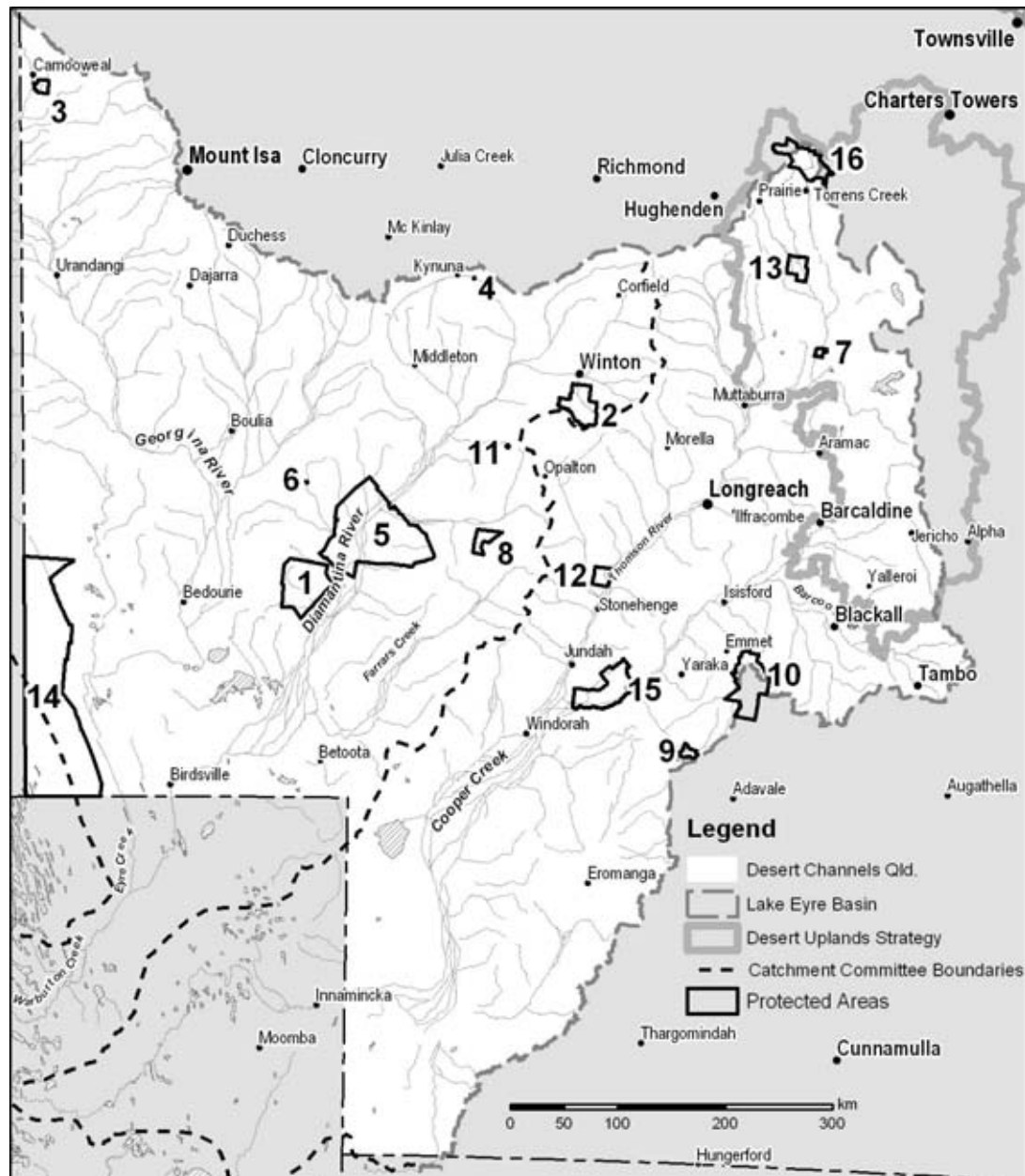
No evidence is available to indicate pastoral practices, largely unchanged in 140 years, have elevated the natural salinity levels in the region²⁵.

Protected areas

The DCQ region contains some of the largest National Parks in Queensland. The park estate includes all of Astrebla, Bladensburg, Camooweal Caves, Diamantina, Lochern, Forest Den, Goneaway, Hell Hole Gorge, Moorinya, Simpson Desert and Welford National Parks, and Combo Waterhole, Elizabeth Springs and Lark Quarry Conservation Parks. Other National Parks that straddle the DCQ boundary are Idalia and White Mountains National Parks (see map). The total area of park estate in the region is 21,300 km² or 4.2% which is around the state average.

²⁵ See 'Soils'

Figure 3: Protected areas



Key: Astrebla NP = 1; Bladensburg NP = 2; Camooweal Caves NP = 3; Combo Waterhole CP = 4; Diamantina NP = 5; Elizabeth Springs CP = 6; Forest Den NP = 7; Goneaway NP = 8; Hell Hole Gorge NP = 9; Idalia NP = 10; Lark Quarry CP = 11; Lochern NP = 12; Moorinya NP = 13; Simpson Desert NP = 14; Welford NP = 15; White Mountains NP = 16

These reserves, managed by the Queensland Parks and Wildlife Service (QPWS), help protect biodiversity, but it is notable that nearly all the 'Of Concern' and 'Endangered' regional ecosystems identified in the region fall outside protected areas and are not comprehensively covered²⁶.

In addition to declared parks, reserves and conservation areas, more than 100,000 hectares of private land in the region are subject to 'Land for Wildlife' voluntary nature conservation agreements.

²⁶ See 'Vegetation management'

2.5 Community

More than 60% of the region's 14,500 inhabitants live in 25 towns which vary in size from 15 to 3,800 people. The rest are widely scattered across half a million square kilometres of extensive pastoral country, most of these in the northeast. While the region's 900 Indigenous residents are spread throughout, most live in the west and northwest, the latter being home to several Indigenous communities.

Both rural and town communities are dominated by the pastoral industry: if the cockies are feeling the pinch, businesses in the towns are as well. It is a dynamic community, much changed from fifty years ago with some changes being driven by technology; some by economics.

Satellite television came to the outback in the 1980s and, in the past decade, telecommunications for rural residents has progressed from party lines and manual exchanges to a modern Digital Radio Concentrator System coupled, in most cases, with broadband satellite internet services. This communication, information and entertainment revolution has permanently altered the amount and type of social interaction. Without leaving your home you could be informed, entertained or transported to a world far away from the everyday.

Since the labour intensive early days of the pastoral industry and the boom of the 1950s, the population of the region has generally been in steady decline. Increased mechanisation and tighter margins in the pastoral industry has led to a smaller workforce with fewer employment opportunities for young people and less willingness to be saddled with the financial burden and uncertainty of land ownership. Consequently, the average age of landholders has increased and many of the next generation have left the area for greener pastures. This, coupled with the improvement in roads and advances in four-wheel-drive design, has seen a major change in the traditional small and localised community of interest of rural people.

Where once a rough and dusty one hour trip would get you to a central spot for sport, dances or similar social events, now a smooth, air conditioned drive of the same length of time sees you in a town with modern amenities.

Over the last decade, the shift from sheep to cattle has been a major factor in population decline. Not only is there less labour required 'on-farm' but the flow-on effect to towns that were once home to hundreds of shearers and related sheep industry workers has been severe. The number of shearing teams that can find permanent work in the region has dropped by about 75%. This brings a related drop in cash-flow in the community.

In recent years, cashed-up, absentee cattlemen have bought enterprises that once supported families. Many of these properties now have only a single caretaker in residence or no one at all.

For this traditionally pastoral community, the silver lining has been the upsurge of interest by coastal fringe Australians in connecting with their cultural roots and exploring the outback and its ethos. Over the last decade, tourism has emerged as a significant industry and in some shires has overtaken grazing as the biggest income generator.

Health

The DCQ region, despite its scattered population, has an extensive health network. Hospitals, private practices, specialist mobile clinics and the Royal Flying Doctor Service combine to meet most day-to-day health needs. Retirement homes and aged care facilities also have a strong presence.

Education

The education needs of the region are met by 26 State-run schools (4 are schools of distance education servicing the remote areas; 3 of these are situated outside the region) and 4 Catholic schools. Most remote area students complete their secondary studies at boarding schools on or near the coast.

Longreach Pastoral College was the first rural training school in Queensland and is the only Queensland institution solely devoted to pastoral management. It is also a branch of TAFE and provides a range of training opportunities including apprenticeship support.

Communications

Communications services within the DCQ region have been improving steadily. There is 100 per cent coverage with satellite hand-held mobile systems and the CDMA mobile phone network now encompasses all the major population centres.

Telstra Country Wide has delivered improved local access to the Internet from fixed phones, and high-speed internet access to regional areas via Telstra Bigpond Satellite and ADSL services. The main centres also have alternative internet service providers.

ABC Radio Western Queensland, based in Longreach, is the mainstay of rural broadcasting across the region. ABC Radio Carpentaria and the commercial stations, 4LG and 2WB complement it.

Indigenous community radio is growing, guided by the National Indigenous News Service. MOB FM broadcasts out of Mount Isa and the ATSIC Regional Council in Rockhampton is investing in community radio with the intention of rolling it out to regional communities.

Mount Isa's daily North-West Star, and the weekly Longreach Leader enjoy wide circulation in the region and are supported by a number of small local papers and newsletters. The main Indigenous papers are the fortnightly Koori Mail and National Indigenous Times. The Brisbane-based Queensland Country Life is the rural issues paper of choice for most of the region.

Primary production

The Desert Channels region has, since European settlement, been the home of a substantial pastoral industry. This has generated riches far beyond the boundaries of the region by providing food and fibre to the world.

In the heyday of the wool industry, when 'Australia rode on the sheep's back', the sea of grass across the Mitchell grass downs gave rise to famous merino studs such as Isis Downs, Terrick Terrick and Portland Downs in addition to hundreds of smaller sheep holdings.

The lush Channel Country pastures were a critical link in the vast cattle empire of Sir Sidney Kidman, 'The Cattle King', who built a chain of cattle properties from northern Australia to the Murray River.

The cattle enterprises of the Channel Country are still an important part of the beef industry. Road transport or drovers move cattle from breeding properties, often to the northwest of the region, to properties in the Channel Country where they are 'grown out' to feedlot weight or fattened.

An estimated 0.5 to 1 million head of cattle are run in the Channel Country of Queensland, with a reputed turn-off value of \$150 million following major flood events such as in 2000.

The past decade has seen a significant shift from sheep to cattle. The price crash, at the end of the wool floor price scheme, combined with drought to make sheep almost worthless. A subsequent pick-up in prices has improved the outlook but flock numbers have continued to decline due to competition for land from beef producers, good live sheep export prices, good mutton prices, wild dogs predation and low reproductive rates.

There were an estimated 6 million sheep in Queensland in 2003, down from around 19 million in the late 1980s. Muttaborra, once home to six shearing teams is now struggling to maintain one.

Emerging primary industries in the region include:

- goat meat production
- native foliage enterprises
- forage hay
- aquaculture
- meat sheep
- organically grown beef

Wild game harvesting of kangaroos and feral pigs provides significant local employment. Most towns have a wild game chiller, and there is a human consumption processing plant located at Longreach.

Gross value of primary production in the Central West area of the DCQ region²⁷ for the year ending March 1999 was \$193.4 million (3% of the Queensland total).

There are relatively few animal husbandry issues unique to the region. Dry season nutrition is an issue as pastures decline and there is an increasing use of nutrition supplements. The risk of diseases like brucellosis, tuberculosis, and leptospirosis, although not great, is ever-present.

Three-day sickness in cattle is a seasonal concern, while botulism is a common disease in parts of the region, and Equine Infectious Anaemia (EIA) an ongoing risk to horses.

²⁷ The Central West statistical area is a very rough overlay for the region: it doesn't cover all the DCQ region, and includes areas outside of DCQ.

Tourism

Outback Queensland in 1996-97 attracted 323,000 visitors, with direct tourism expenditure totalling \$86.3 million. In 2001 an estimated 714,000 visited the region.

Facilities range from corporate style heritage centres like the Australian Stockman's Hall of Fame, through local council initiatives such as Boulia's Min Min Centre, to privately run enterprises like the Birdsville Machinery Museum.

Local government's view of tourism as a viable and important economic activity is reflected in their employment of tourism officers, and the development of tourism plans.

Findings from the Lake Eyre Basin Coordinating Group's Heritage Tourism Project show that tourism is rapidly emerging as a major form of land-use alongside the more traditional pastoralism, agriculture, and mining. Natural and cultural heritage assets are now seen as commodities with commercial value. This has a significant bearing on issues of access both on pastoral leasehold lands and protected areas. It is also becoming a major consideration in the sustainable management of key visitation sites such as waterholes.

Mining & petroleum

The mining and petroleum industry is diverse and growing, and is currently the largest generator of wealth in the region. Technological advances in exploration, extraction and recovery have unlocked previously unavailable mineral deposits. These advances are also making oil and gas exploration more efficient and increasing the production life of wells.

It is difficult to put a figure on current value of production but it is likely that the three major mines in the northwest of the region, Cannington (silver/lead), Osbourne (copper/gold) and Phosphate Hill (rock phosphate), contribute the better part of a billion dollars to Australia's economy each year.

Major oil and gas facilities are located on the lower Cooper. The Ballera gas plant pipes gas to Mt Isa while the Jackson oil production facility, 70 km southeast of Ballera, processes oil from surrounding fields and pipes it to Brisbane. Santos' sales revenue from the Cooper Basin in South Australia and Queensland was around \$1.5 billion in 2002.

One of the challenges faced by both the mining and petroleum industries has been water management; all the larger mines rely on groundwater for processing. In some cases excess water is pumped from mine pits and oil and gas fields, resulting in significant discharges into local streams.

Environmental compliance from these large enterprises is of a high standard and the corporations that manage them have been willing partners in the community natural resource management process in the region.

Other mining enterprises include gypsum and opal mining which is mainly centred along the watershed between the Diamantina and the Cooper catchment. The record of this industry in terms of land rehabilitation and control of weed spread has not always been good but there are encouraging signs that this is changing.

Waste management

In the absence of heavy industry, urban waste disposal is the major waste management issue in the region. Local governments are slowly improving their waste management in larger centres like Longreach by moving to separate waste rather than burning. This approach still has challenges in terms of the volume of landfill that results.

Developing a regional approach to recycling materials like cardboard (estimated at more than 30% of the waste stream), tyres and plastics is required. A major challenge is the high freight cost to recycling plants on the coast in comparison to the value of the recovered material.

Management of contaminated soil on pastoral properties from the use of residual chemicals such as DDT, Dieldrin and Arsenic in sheep dips, stock yards and buildings is an ongoing issue.

3. 2020 vision

3.1 Where are we headed?

Change has always been part of the Desert Channels Region. A region with a small population, largely dependent on the productivity of its natural resources, where nearly all production is exported from the region, is always going to be affected by external forces. There are further challenges when this production relies on a highly variable climate.

The following table is an overview only. It is not intended to be comprehensive, but to give a feel for where we are now and where, on present indications and with moderate optimism, we might be in 2020.

Table 1: Where are we headed?

Issue	Now	2020	Comment
Community	Community is becoming more capable and confident in addressing NRM issues but the participation rate is modest.	Community capability and participation in NRM activities is maintained at a high level.	There needs to be long-term vision and sustained support from all partners for community-based NRM.
	Steady decline in regional population 60% /40% town/country.	Regional population stable 70%/30% town/country.	Significant decline in people working on ground. Reduced ability to undertake labour intensive jobs (e.g. weed control) unless new technology compensates.
Natural Resource Management	Weed pressures from north and east increasing. Significant areas in the north impacted by exotic weeds.	Eastern part under greater threat from parthenium and giant rat's tail grass. Prickly acacia and parkinsonia have been contained and core infestation areas better managed through use of browsing animals.	Continued vigilance necessary, remote sensing may be able to map outbreaks for earlier intervention. Reduction in impact of exotic weeds has some economic value (grazing or fuel).
	GAB bore capping and piping well under way, but significant amounts of water continue to be wasted through unregulated bores and open bore drains.	All bores capped and bore drains replaced with piping systems leading to water saving, pressure restoration, and improved environmental management.	Improvements in pressure allow some artesian springs to recover whilst allowing reallocation of water.

Issue	Now	2020	Comment
Industry	Pastoral production largely limited to cattle (increasing) and sheep (decreasing). Small but increasing area devoted to organic livestock production. Limited 'whole of enterprise' planning.	Sheep industry more dependent on meat rather than wool. Goats and camels more common. Significant involvement in organic or low chemical use production. Enterprise planning at a high level to meet accreditation requirements.	Continued wild dog control is essential for the viability of the sheep/goat industry. Browsing animals may reduce pressure on pastures and can more effectively control woody weeds. Region effectively marketed for its green credentials.
	Grazing property size increasing in the eastern part of the region.	Property size has stabilised.	Improving the efficiency of grazing enterprises also needs to take into account the cost of managing the region's assets.
	Grazing industry infrastructure (eg. fences and waters) has still got potential for further development in significant parts of the region (Desert Uplands and Channel Country)	Infrastructure now at a much higher standard with more extensive piping of water and improved fencing and stock handling facilities	More effective management of grazing possible but may reduce refugia for biodiversity or place unsustainable stress on water supplies.
	Mining industry and oil and gas production expanding.	New mining ventures still coming on line as exploration technology improves. Oil and gas production has levelled out or is in decline. Region still plays a key part in the national gas distribution network.	Although the greatest generator of wealth there are still very few residents of the region working in these industries.
	Tourism is delivering significant economic value but concerns exist about long-term sustainability.	Tourism is a sustainable part of the regional economy but is impacted by rising transport costs.	Sustainable tourism management practices need to be developed.
Infrastructure	Limited power grid, high cost, and greenhouse impacts. Solar/wind power available but at high cost.	Reliable power available. Geothermal power a major regional export. Solar/wind technology available at modest cost for remote centres.	Region may market its green credentials more effectively and may be able to provide energy at a competitive cost.
	Communication network has improved greatly but some locations still have low quality access and reliability.	Reliable mobile communication available throughout the region at modest cost.	Satellite communication needs to be much cheaper if it is to achieve widespread use.

Issue	Now	2020	Comment
	Transport infrastructure improving but limited sealed road network in the channel country. Many roads still affected by periodic, local flooding.	Sealed roads network throughout the region with less roads affected by local flooding. Some marginal rail lines have closed but a national heavy freight rail line passes through the eastern part.	High transport costs will remain a major hindrance to the region.
Planning	Information base on the region's natural resources is modest and access is limited.	Significantly better information base and accessibility.	Much better basis for planning and decision making.
	Regional planning is progressing but has not yet been integrated.	Integrated plan in place for regional development and NRM.	Possibility of one integrated regional body.
Conservation	Many endangered ecosystems are not captured in Park estate or adequately managed on private land. Management planning on Parks is not advanced and the level of on-ground management and visitor facilities is limited.	Park estate includes a greater representation of endangered ecosystems. Park management resources and visitor facilities are of an appropriate standard. All endangered ecosystems outside the Park system protected by private covenants.	Emphasis on acquisition will be replaced by long-term management strategies and resourcing along with incentives for conservation of ecosystems on private land.

4. Natural resource management in the Desert Channels region

Since the late 1980s there has been significant community activity in NRM. This began with the landcare movement and then moved to the establishment of regional groups in the Desert Uplands and Lake Eyre Basin in the mid 1990s. In 2002 new regional arrangements were foreshadowed with the creation of Desert Channels Queensland and downstream in SA, the Rangelands Integrated Natural Resource Management Group.

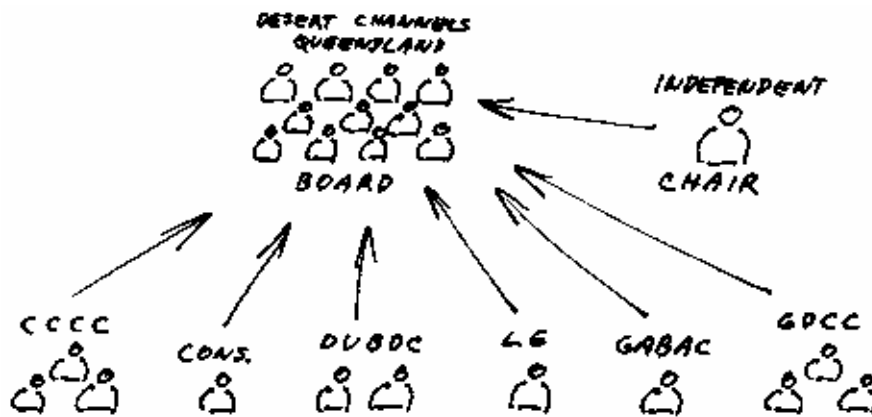
4.1 The Desert Channels Board



The original Desert Channels Queensland Board along with the Planner and Regional Coordinator (from left): Jim Meteyard (DU), Bob Young (GD), Maree Morton (CC), Dougal Davidson (Local Government), Lesley Marshall (DU), Peter Douglas (Chair), Mike Chuk (Planner), Angus Emmott (CC), Steve Wilson (Coordinator), Trevor Whitelaw (GD), Bill Bode (Great Artesian Basin Advisory Council). (Note: DU = Desert Uplands Build-up and Development Strategy Committee; GD = Georgina Diamantina Catchment Committee; CC = Cooper's Creek Catchment Committee.)

Desert Channels Queensland Inc. (DCQ) has been formed to develop an NRM plan for the largest region in Queensland - the Queensland section of the Lake Eyre Basin. The Desert Channels Board brings together representatives from the Cooper's Creek and Georgina Diamantina Catchment Committees (includes two Indigenous representatives); the Desert Uplands Build-up and Development Strategy Committee (DUBDSC); local government; conservation; and the Great Artesian Basin Advisory Council (GABAC) (see Fig 2).

Figure 4: DCQ Diagram



Abbreviations: CCCC = Cooper's Creek Catchment Committee; Cons = Conservation; DUBDC = Desert Uplands Build-up and Development Strategy Committee; LG = Local Government; GABAC = Great Artesian Basin Advisory Committee; GDCC = Georgina Diamantina Catchment Committee.

The Georgina Diamantina Catchment Committee, Cooper's Creek Catchment Committee and the Desert Uplands Build-up and Development Strategy Committee are the key implementation groups of the region and have been heavily involved in projects from weed and feral animal control, on-ground nature conservation and land resource mapping, to educational CDs. These groups have been well supported by Landcare groups and Town Common groups.

4.2 Key themes of natural resource management

Natural resource management planning upstream in the NT is being undertaken on a Territory-wide basis by the Landcare Council of NT. Downstream in SA the Rangelands Integrated Natural Resource Management Group covers most of the north of that state. These areas, due to their small population, have opted for a community-of-interest rather than a catchment approach.

The DCQ planning process will actively deal with cross-border issues with neighbouring interstate NRM bodies (see Part C). The Lake Eyre Basin Agreement policies and strategies will assist in guiding the process in dealing with the South Australian Rangelands Integrated Natural Resource Management Group.

5. The planning framework

The Desert Channels Plan is written to take into account the substantial experience and knowledge available within the region. It reflects the aspirations of the community, but must also support Commonwealth and Queensland policy frameworks for managing our natural resources.

5.1 Overarching policy, legislation and related planning

Natural resource management planning is supported by legislation, policies, strategies and agreements at the national level. Of particular significance to this process and region are:

- The Framework for the Extension of the Natural Heritage Trust which sets the scene for the second round of the Natural Heritage Trust (NHT2)
- The Interim Financial Agreement to Deliver the Natural Heritage Trust in Queensland outlines the arrangements in place between the Australian and State governments regarding NHT2. This agreement provides the resources for the establishment of regional NRM groups and the development of regional plans, and their implementation.

There are a number of national policies that also provide direction for NRM. Some key ones for this region are:

- *National Strategy for Ecologically Sustainable Development* provides broad strategic directions and a framework for governments to direct policy and decision-making towards sustainable use of our resources;
- *National Principles and Guidelines for Rangeland Management* addresses the sustainable management of Australia's rangelands;
- *National Strategy for the Conservation of Australia's Biodiversity* seeks to protect biological diversity and maintain ecological processes and systems;
- *National Framework for the Management and Monitoring of Australia's Native Vegetation* details a range of 'best practice' measures, including regional vegetation management;
- *National Water Quality Management Strategy* seeks to protect and enhance the quality of water resources while maintaining economic and social development;
- *National Weeds Strategy* provides the mechanism to reduce the impact of weeds on the sustainability of Australia's productive capacity and natural ecosystems;
- *National Principles for the Provision of Water for Ecosystems* deals with providing water for ecosystems during the process of water allocation planning.
- *Great Artesian Basin Strategic Management Plan 2000* provides direction for the sustainable management of the Great Artesian Basin.

The core piece of legislation for the Lake Eyre Basin is the *Lake Eyre Basin Agreement*. This agreement provides a process and context for the Commonwealth Queensland, South Australian and Northern Territory Governments to 'come together in good faith,

to develop and implement agreed policy on water and related NRM issues that have potential cross-border impacts'.²⁸

The *Lake Eyre Basin Agreement*, which was signed in 2000 by the Commonwealth, South Australian and Queensland Governments, and in 2004 by the Northern Territory, is supported by the following legislation²⁹:

- *Lake Eyre Basin Intergovernmental Agreement Act 2001 (Commonwealth)*
- *Lake Eyre Basin Intergovernmental Agreement Act 2001 (SA)*
- *Lake Eyre Basin Agreement Act 2001 (Qld)*

Another joint federal/state arrangement is the *Great Artesian Basin Strategic Management Plan*, which provides a strategic framework for responsible management of groundwater and related natural resources in the Great Artesian Basin.

At the state level the following legislation and policies are relevant:

- The *Water Act 2000* guides the management of surface and ground water including planning, allocation and licensing. Water management plans are in place for the Cooper Creek and the Georgina/Diamantina catchments;
- The *Vegetation Management Act 1999* and the *Vegetation Management and Other Legislation Amendment Act 2004* regulate the management of vegetation through the *State Policy for Vegetation Management* and *Regional Vegetation Management Codes*;
- The *Land Act 1994* deals with leasehold and other state land management, and includes lease conditions. The *Draft State Rural Leasehold Land Strategy* has been released to provide a policy framework for the sustainable management of state rural leasehold land;
- The *Land Protection (Pest and Stock Route Management) Act 2002* regulates the management of pest animals and plants, stock routes and local government land protection plans. The *Queensland Weeds Strategy* and *Queensland Pest Animal Strategy* provide direction for pest management and all shires in the region have developed pest management plans. Most shires have commenced stock route management planning and a *Draft Queensland Stock Route Network Strategy* has been prepared;
- The *Nature Conservation Act 1992* guides the protection of biodiversity, and habitat, allows wildlife licensing and trade, protects the national park estate, and provides requirements to plan for its future management. Management plans are in place for most parks in the region;
- Local government in the region deals with development applications under the *Integrated Planning Act 1997*. This may include assessing the land-use suitability of a proposed development.
- *Partnerships Queensland: the way forward for Aboriginal and Torres Strait Islander* is a discussion paper on providing an integrated, whole-of-Government policy framework for addressing issues affecting Indigenous Queenslanders.

²⁸ Lake Eyre Basin Agreement Discussion Paper, 1999.

²⁹ Legislation is yet to be passed in the NT.

Most local authorities in the region are members of the Central Western Queensland Remote Area Planning and Development Board (RAPAD). The revision of RAPAD's *Central Western Region Strategic Plan*³⁰, commenced in 2004, addresses NRM issues including the development of alternative policy for the successful management of the Lake Eyre Basin and water management. It and this plan remain mindful of each other.

5.2 Building on existing plans and information

Natural resource management priorities have been established through several community processes in the region and are outlined in:

- *Desert Uplands Natural Resource Management Plan*³¹;
- *Strategic Plans for the Lake Eyre Basin*³²;
- *Cooper's Creek Catchment Strategic Plan*²⁵;
- *Georgina/Diamantina Catchment Strategic Plan*²⁵.

As part of extensive community consultation in the mid to late 1990s these groups identified a number of issues; areas of concern that impact on the natural resources of the region. These include (in alphabetical order):

- Biodiversity Conservation / Endangered Species
- Chemical Contamination / Waste Management / Pollution
- Climate Risk and Drought
- Diversification
- Education / Awareness
- Grazing Pressure / Pasture Management / Safe Carrying Capacity
- Great Artesian Basin
- Indigenous Land Management
- Lack of data
- Land Degradation
- Mining and Petroleum
- Property Management Practices / Planning
- Salinity
- Security of Tenure
- Streamline Ecology
- Surface Water Management
- Tourism
- Vegetation Management

³⁰ Remote Area Planning and Development Board – 1995.

³¹ Desert Uplands Build-Up & Development Strategy Committee 1999

³² Lake Eyre Basin Coordinating Group, 2000

- Viability / Economics
- Weeds / Feral Animals
- Wildlife use / harvesting

This list of issues was taken back to the community for prioritisation in the 18 community meetings held around the Desert Channels region in October 2003.

Other NRM planning processes that have involved substantial community input include the development of the *Cooper Creek Water Management Plan* in the late 1990s and, more recently, the *Water Resource (Georgina and Diamantina) Plan 2004*.

Both plans recommend a range of actions including community participation in information gathering and extension.

The Regional Vegetation Management Planning process has also involved significant contributions from the community. The eight plans covering the region are:

- Desert Uplands North
- Desert Uplands South
- South-eastern Mitchell Grass Downs
- North-western Mitchell Grass Downs
- Channel Country
- Mulga Lands
- Brigalow Belt South
- North West Highlands

With the passage of the *Vegetation Management and Other Legislation Amendment Act 2004* these vegetation management plans are no longer binding. However, these plans are the basis for the codes of practice for ongoing management of vegetation beyond the cessation of broadscale tree clearing at the end of 2006 (see 'Vegetation management' in section 2.2).

Local government makes significant investments in pest management. All shires in the DCQ region have pest management plans in place and are currently working on stock route management plans. Members of the Shire Rural Lands Officers Group of Western Queensland³³ have contributed significantly to the development of this plan.

The Best Practice Wild Dog Control Project is a cooperative venture between the shires of Tambo, Blackall, Barcaldine, Aramac and the Department of Natural Resources and Mines. Individual shire expenditure on this project is up to \$100,000 per year.

Local government has issues with water management in some areas, but away from the area of pests and stock routes, generally has not been focussed on land-use. Given the modest rate base of the shires of the region, and the substantial and rising commitment to pest management, there is a clearly stated reluctance by local government to divert funds to other NRM issues at this time.

³³ Initiated by the Cooper's Creek and Georgina Diamantina Cross-Catchments Weeds Initiative.

5.3 How the regional plan was prepared

The Desert Channels Regional Plan was developed over 18 months from April 2003 to October 2004 (see Table 2).

Table 2: DCQ Planning

Apr to Aug	Sep	Oct	Nov to Jan	Feb	Mar	Apr	May to Jul	Aug	Sept	Oct
Planning and information gathering										
	Community Information Paper written		Community Information Paper revised and updated							
		18 community meetings								
			Feedback and consultation							
				Action Planning workshop						
				Draft Plan developed			Draft Plan released for comment			
				Regional Investment Strategy (RIS) developed						
							Public consultation meetings			
								Incorporation of community and government feedback		
										Final plan and RIS sent to Govt for endorsement

The first step was to bring together a planning team from Desert Channels Queensland, Desert Uplands, Lake Eyre Basin Coordinating Group, and the Cooper's Creek and Georgina Diamantina catchment committees. This team, in consultation with the Desert Channels Queensland Board and the Central Queensland Regional Coordination Group³⁴, developed a work plan, which comprised the following stages.

³⁴ The RCG comprises representatives of five state agencies – Departments of Primary Industries and Fisheries, Natural Resources and Mines, Environment Protection Agency, Local Government and Planning, and State Development.



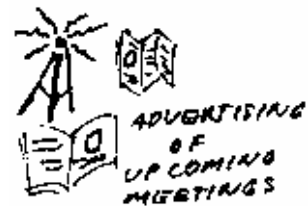
Stage 1. A Community Information Paper (CIP) was developed. This is a 70-page document that describes the landscape, natural resources, history, economy, and community of the region. It identifies the threats to our natural resources and outlines the story of community involvement in NRM in the region.

The CIP was published in September 2003, updated in 2004, and is available on the web at: www.dcq.org.au

Up to October 2004 this document has been downloaded 2,324³⁵ times. In addition more than 200 hard copies have been circulated in the region. Feedback on the document has been positive, particularly that the information was useful and readable.

Stage 2. A blanket advertising coverage, via newspaper, radio and a pamphlet mail-out to every household in the region, of upcoming community meetings.

Stage 3. 18 meetings were held around the catchment to raise awareness of the planning process and to give the community an opportunity to raise local issues.



These meetings were held at Innamincka, Eromanga, Yaraka, Windorah, Stonehenge, Longreach, Winton, Boulia, Bedourie, Birdsville, Dajarra, Urandangi, Camooweal, Blackall, Barcaldine, Aramac, Muttaborra and Kooroorinya.

Participants voted on the importance of each of the 21 identified issues (see page 42) against five assets: Land, Vegetation, Water, Biodiversity and Community. A rating system was used so people could see how each issue ranked against individual assets, and across all the assets combined. This process and the outcomes are described more fully in the Communication Plan available at www.dcq.org.au.

This method worked well and was embraced by the participants. The technique was later made available for use by neighbouring NRM bodies.

The six highest-ranking issues were (in order of priority):

- Weeds/feral animals
- Vegetation management
- Grazing pressure/Pasture management/Safe carrying capacity
- Surface water management
- Land degradation
- Viability/economics

³⁵ From 27th May 2004, when it was posted on the website, until 14th October 2004, the draft version of this plan has been downloaded 2,837 times.

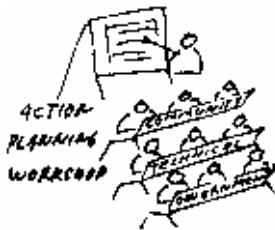
This was the most comprehensive series of public meetings held on NRM in the region to date. Despite one of the worst droughts on record in many parts of the region, over 150³⁶ community members attended the meetings.

Stage 4. A newsletter was sent to all participants after the meetings so people could get a perspective of local differences and an overall, regional view of the issues.



Stage 5. An action-planning workshop was held in February 2004 at Longreach. Representatives of each of the community meetings were invited, together with technical experts and representatives of the Regional Coordination Group and the Joint Steering Committee³⁷, which will assess and endorse the regional plans.

The workshop, titled 'Planning our actions - thinking about targets', was held over two days and, despite flooding in parts of the region, 60 people attended. The aim was to get representatives of the 18 community meetings together to decide



(with technical advisors at hand) on priorities for investments against the four assets (Land, Water, Biodiversity and Community) and one issue (Weeds and Feral Animals) that will be dealt with in this plan. For simplicity, in the first round of public consultation, vegetation was listed as a separate asset; in this plan, it is split across Land and Biodiversity. Weeds and Feral Animals is obviously not an asset but, as the single over-riding issue identified by the community throughout the region, it has been included.

Technical teams made presentations in the five areas then the participants, in small groups, discussed the information and settled on priorities which were fed into the actions for this plan. Resource condition targets³⁸ and their application in the region were also discussed. A summary of workshop outcomes was circulated to participants; these outcomes formed the basis for the actions in this plan.

Stage 6. This plan was put together by the DCQ Planning Team from material gathered in the previous five stages. Its draft form was launched in April 2004 and presented to the community at a number of meetings around the region during June and July 2004. It remained open for feedback and comment until the end of July 2004.



Stage 7. Community and government feedback was incorporated.

³⁶ This amounts to 1.03% of the region's population. More than 3200 of Canberra's residents would need to turn out to achieve the same level of participation.

³⁷ A joint committee made up of senior officers from relevant Commonwealth and State agencies.

³⁸ Refer to Part B for details.

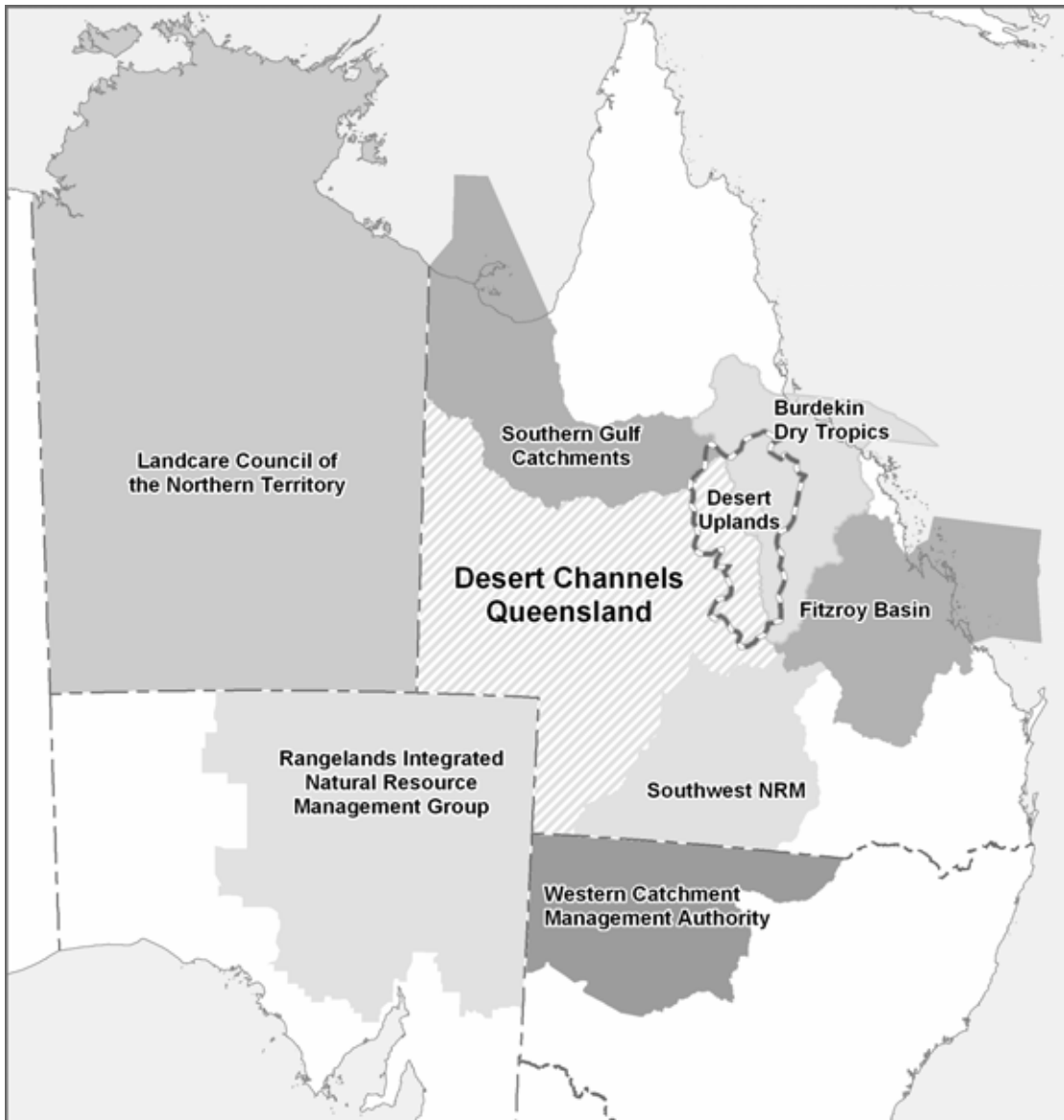
Stage 8. This plan was then sent to the Commonwealth/State Joint Steering Committee (JSC) who then recommends it to Ministers for approval. It will remain a living document, open to change as required.



5.4 Inter-regional arrangements

DCQ borders seven other regional bodies: Southern Gulf Catchments, Burdekin Dry Tropics, Fitzroy Basin Association and South West NRM (all in Queensland), the Landcare Council of the Northern Territory, Rangelands Integrated Natural Resource Management Group (SA), and Western Catchment Management Authority (NSW).

Figure 5: Natural Resource Management Bodies



Throughout the planning process, Desert Channels has liaised closely with each of these groups. They are all rangelands groups with similar challenges of large areas and small populations; only the eastern parts of the Burdekin Dry Tropics and Fitzroy Basin differ.

Our closest ties, however, are with our interstate regional neighbours; they share the same drainage basin, the Lake Eyre Basin.

Much of the community support for this regional process has flowed from the Lake Eyre Basin process (see www.lakeeyrebasin.org.au). Naturally, our community retains its focus on the upstream and downstream, cross-border issues in the Lake Eyre Basin.

The following is a summary of the inter-regional collaboration to date:

Southern Gulf Catchments

Desert Channels has provided assistance to Southern Gulf with information management and has collaborated with Indigenous facilitation and weeds management. A significant proportion of the DCQ Indigenous population is in the north-west of the region and is closely aligned to adjacent areas of the Southern Gulf around Mt Isa. There are shared initiatives in weed control; the main infestation area of Prickly Acacia, Mesquite and Parkinsonia lies across the watershed between the Lake Eyre Basin and the Southern Gulf catchments.

Burdekin Dry Tropics

The Desert Uplands Build-up and Development Strategy Committee Inc. is based on the Desert Uplands bioregion which is split between the Desert Channels region and the Burdekin Dry Tropics (BDT). DCQ and BDT are joint contributors to the operational costs of this group and there are likely to be shared investments to deliver outcomes across the Desert Uplands.

Fitzroy Basin Association

Although they only share an 80 kilometre common boundary, FBA provided considerable assistance to DCQ, especially in the early days of planning. This included advice on community consultation, planning and Indigenous representation, as well as guidance in Regional Investment Strategy development.

South-West NRM

There has been regular contact with SW NRM through attendance of community and other face-to-face meetings. DCQ and SWNRM have many similar issues as they share the Mulga Lands³⁹ and Channel Country⁴⁰ bioregions. Of particular issue are woodland thickening, fodder harvesting and total grazing pressure.

Rangelands Integrated Natural Resource Management Group (SA)

There has been close collaboration between DCQ and RINRMG over the planning period. This is reflected in the similarity in the structure of our plans, and the inclusion of tables common to both. Cross-border issues and actions are covered more fully in Part C of this document.

³⁹ The Mulga Lands bioregion dominates the South-West NRM region.

⁴⁰ The Channel Country lies predominantly across the DCQ region but extends into the southern Bulloo catchment as well as South Australia and the Northern Territory.

Landcare Council of the Northern Territory

The Landcare Council of the Northern Territory has assumed the role of the regional body for the whole of the Northern Territory. DCQ provided LCNT with the method they used for collating community issues from consultation meetings, and general planning advice. DCQ has also liaised with the Barkly Landcare Group over the upper Georgina catchment, while the Cross-Catchment Weeds⁴¹ and Feral Animals Initiative has funded weed control projects in this part of the NT.

Western Catchment Management Authority (NSW)

This region, the western extremity of which lies in the Lake Eyre Basin, has many issues in common with DCQ. As well as sharing the lessons of planning, there have been discussions on the possibility of a collaborative information management and communication capacity as well as participation in a whole-of-basin communication capability.

5.5 The rangelands vision

Desert Channels Queensland region is pure rangeland. It extends from the sub-tropical grasslands of the north to the saltbush dominated temperate pastures of Australia's southern rangelands.

It has much in common with other rangelands NRM bodies, not just our immediate neighbours. For that reason, there is real value in Australia's 12 rangelands regional bodies getting together to advance the management of our natural resources over the vast rangelands area.

DCQ has taken a leadership role in forming the Rangelands NRM Group Network to provide mutual support and exchange of information between the groups responsible for the extensive but sparsely populated rangelands regions. The first meeting of this group was held in Alice Springs in July 2004. This collaboration shows promise to deliver outcomes that would not, under current funding levels, be achievable by these groups working in isolation. Common issues identified in this plan, with the potential to be dealt with in this way, include setting land and water targets, total grazing pressure, tourism impacts, and wetlands management.

Support for this has come from officers of the Commonwealth Departments of Environment & Heritage, and Agriculture, Forestry & Fisheries, the Desert Knowledge Cooperative Research Centre and the Tropical Savannas Cooperative Research Centre.

⁴¹ A joint initiative of the Cooper's Creek and Georgina Diamantina catchment committees.

Part B - The natural resource assets of the region

This is the key part of the plan; it:

- sets out our aspirations for the future
- indicates where condition targets of our assets may be applicable
- puts forward priorities for action in the region
- proposes management action targets
- indicates potential partners in the business

6. The Desert Channels assets

The Desert Channels plan is titled '*Protecting Our Assets*'. These assets are, from a natural resource management perspective, the pillars of the region. It is the acknowledgement, nurturing, wise use and protection of these assets that will allow us to sustainably manage and use the resources of our region and leave them in a healthy state for future generations. It is the welfare of these assets that will be invested in under this plan.

The concept of looking at our natural resources as assets was taken to the community meetings held around the region. Apart from the issue of vegetation, which is covered both in Land and Biodiversity, the idea of having four assets was accepted well.

The natural resource assets of the Desert Channels Region are:

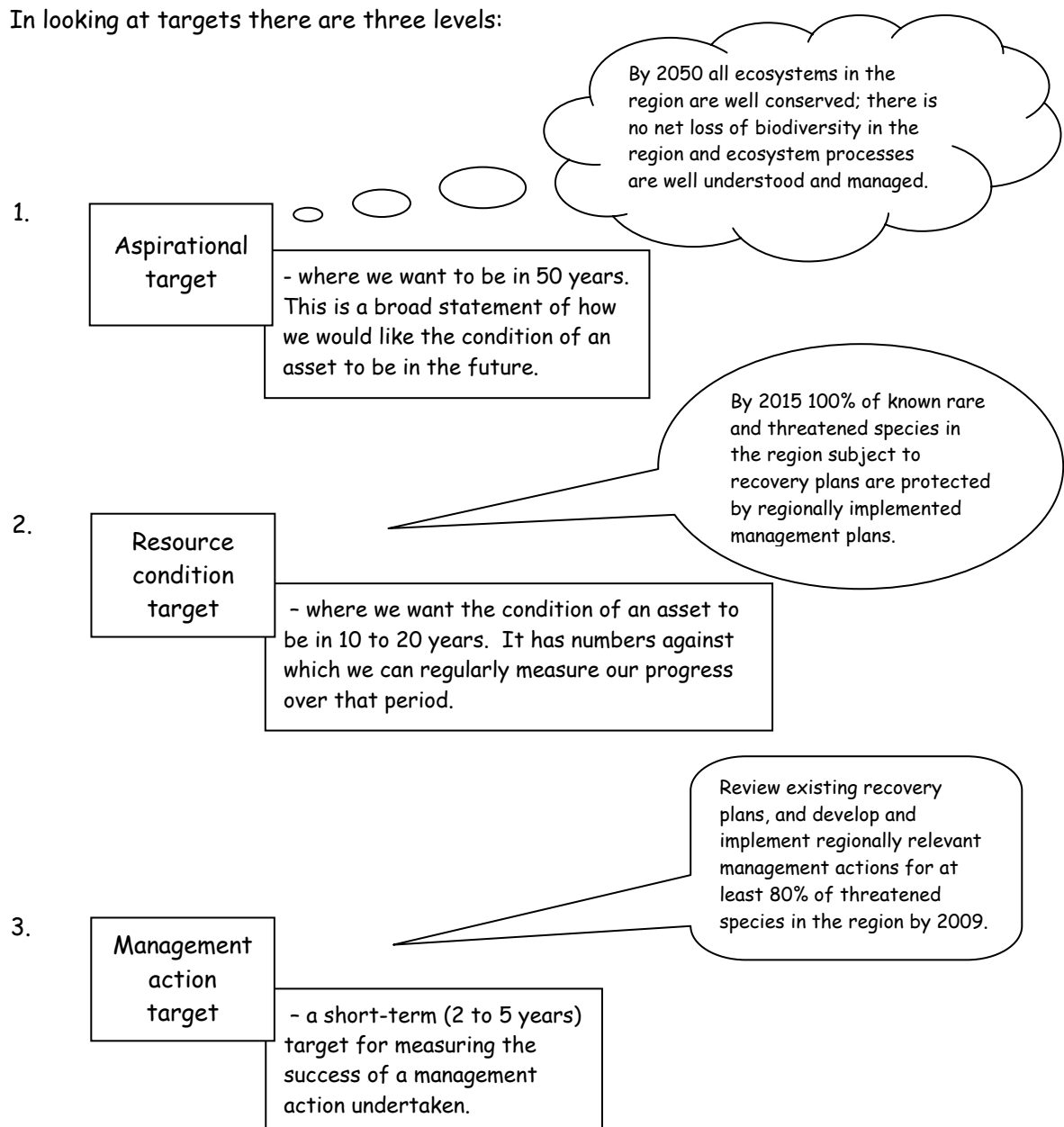
- Land: Geology, landforms and soils shape and support the pastures and other vegetation that determine the way we can productively use the land;
- Water: Aquatic ecosystems and associated catchment processes govern the quality and quantity of water (surface and ground) available to support our biodiversity, productivity and communities;
- Biodiversity: The rich diversity of our region's living things (from soil microbes to large mammals) supports productive ecosystems that provide us with the natural resources on which we depend;
- Community: A well-informed, resourced, motivated and inclusive community will wisely manage its natural resources, heritage and institutions.

In addition to these four assets, the single, over-riding issue identified by the community, weeds and feral animals, has been given separate treatment in this plan and appears alongside these four assets.

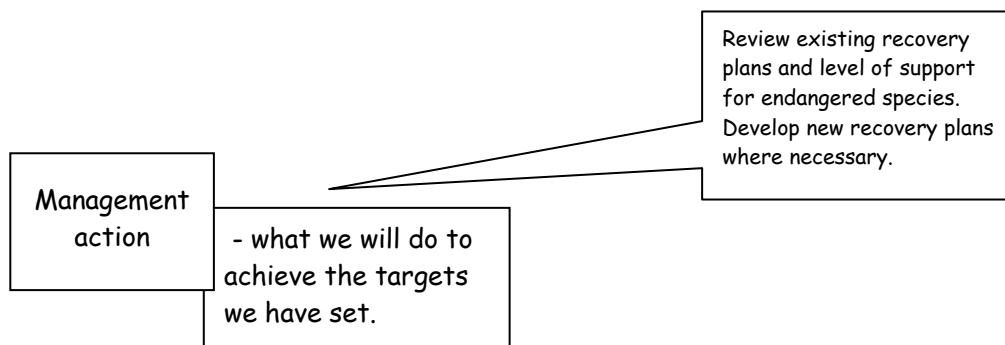
6.1 The targets approach to protecting our assets

In dealing with our natural resource assets, and making investments in their sustainable use and protection, it is sensible to have a long-term vision of where we aspire to be, and to set short-term and medium-term goals to guide our actions to achieve that vision.

In looking at targets there are three levels:



Underpinning these targets are the management actions themselves:



Note: The nuts and bolts details of these management actions will appear in the Regional Investment Strategy.

In setting resource condition targets we must be mindful of three things:

- Current level of understanding of the asset and threats to it;
- Ability of the region to take action, either through devoting resources to action or having influence on the actions of others;
- Availability of monitoring: we cannot set a target for something we cannot measure in the time period to which the target applies. Monitoring can be undertaken by a regional body such as DCQ or by other organisations such as state agencies (see Part E).

In a nutshell, targets must be SMART:

Specific (the target is clear);

Measurable (we have the means of measuring it);

Achievable (it can be done);

Realistic (we have the resources to do it);

Time-bound (there is a clear timetable to get it done).

Critical to success is community understanding of the issue and potential impacts. This particularly applies where the proposed target has the potential to affect a large part of the community, or where the level of change required to meet the target will be significant.

There are two resource condition targets that are currently difficult to set given the level of information available. These are:

- Groundcover (soil condition) - given the wide range of pasture types in the region, work is needed before we can set community accepted, and technically robust groundcover targets. We can, however, set a resource condition target for the trend in land condition i.e. whether it is improving or declining. In addition, we can have a management action that says, for example, we will develop groundcover targets by 2008.
- Water quality - the limited work done so far in the region indicates that the Lake Eyre Basin is a highly variable catchment. There is significant natural turbidity, salinity levels can rise through groundwater in-flows, and nutrient levels can become concentrated due to drying out of waterholes. It is, therefore, difficult to set resource condition targets for water quality at this time. The scale of monitoring required over such a vast area is beyond available resources. This plan proposes management actions to focus on areas where there are known impacts or threats that need to be assessed.

Desert Channels Queensland intends to deal with the issues of setting soil condition, groundcover and water quality targets as a collaborative project with South Australian Rangelands Integrated Natural Resource Management Group (SARINRMG) and other rangelands NRM groups. This work will be linked to the Lake Eyre Basin Rivers Assessment proposed by the Lake Eyre Basin Ministerial Forum.

Other resource condition targets relating, for example, to invasive species, are much easier to set as we have a sound database on weed distribution in the region and have considerable experience in achieving outcomes on this issue.

Under the NHT2 arrangements there is a national framework for target setting⁴². This says that target levels will be set by each region according to its circumstances. Targets should indicate, by a number or a percentage of change, the improvement in the condition of a resource or the decrease in its rate of decline.

This national framework also specifies matters which regional bodies must consider when setting targets for the condition of their resources. Not all apply to the Desert Channels region; those that do are:

- Soil condition
- Ecologically significant invasive species
- Water quality
- Integrity of native vegetation
- Land salinity
- Aquatic ecosystem health
- Significant native species and ecological communities

The following table outlines the NHT2 'national outcomes and regional targets' relevant to the Desert Channels Queensland region. Against each of the 'matters for which regional targets must be set' the relevant resource condition target (see section 6.4) is shown.

As noted on the previous page and in the table below, resource condition targets for water quality have not been set at this time.

Table 3: National outcomes and regional targets relevant to DCQ

National outcomes	Matters for which regional targets must be set		
	Resource	Indicator	RCT
i. The impact of salinity on land and water resources is avoided, minimised or reduced.	a) Land salinity	Area of land threatened by shallow or rising water tables	RCT 1.2
ii. Biodiversity and the extent, diversity and condition of native ecosystems are maintained or rehabilitated.	b) Soil condition	Soil condition	RCT 1.1
	c) Native vegetation communities' integrity	Native vegetation extent and distribution. Native vegetation condition	RCT 4.1, 4.2, 4.3
iii. Populations of significant species and ecological communities are maintained or rehabilitated.	d) Inland aquatic ecosystems integrity (rivers and other wetlands)	River condition.	RCT 3.1, 3.2
iv. Ecosystem services and functions are maintained or rehabilitated.		Wetland ecosystem extent and distribution. Wetland ecosystem condition	

⁴² The National Framework for NRM Standards and Targets.

National outcomes	Matters for which regional targets must be set		
	Resource	Indicator	RCT
v. Surface and groundwater quality is maintained or enhanced.	e) Nutrients in aquatic environments	Nitrogen in aquatic environments.	None set
vi. The impact of threatening processes on locations and systems which are critical for conservation of biodiversity, agricultural production, towns, infrastructure and cultural and social values, is avoided or minimised.		Phosphorus in aquatic environments	
vii. Surface water and groundwater is securely allocated for sustainable production purposes and to support human uses and the environment, within the sustainable capacity of the water resource.	f) Turbidity / suspended particulate matter in aquatic environments	Turbidity/suspended solids	None set
	g) Surface water salinity in freshwater aquatic environments	In-stream salinity	None set
viii. Sustainable production systems are developed, and management practices are in place, which maintain or rehabilitate biodiversity and ecosystem services, maintain or enhance resource quality, maintain productive capacity and prevent and manage degradation.	h) Significant native species and ecological communities	Selected significant native species and ecological communities extent/ conservation status	RCT 4.3, 5.1
	i) Ecologically significant invasive species	Extent and impact of selected ecologically significant invasive vertebrate and vegetation species	RCT 2.1, 2.2
	Management action targets		
	1.	Critical assets identified and protected.	
2.	Improved land and water management practices adopted.		

6.2 How did we decide on our actions?

This plan is about protecting our assets through identifying threats then developing management actions to get our resources to a desired condition.

The actions proposed, and the targets they support, have been developed from several sources:

- Past actions - from work undertaken by governments, community groups and other stakeholders in addressing natural resource management issues in the region. A number of these actions are listed in the Community Information Paper [ref 9].
- Community issues - from community meetings held around the region as part of the Desert Uplands and Lake Eyre Basin process over the past 10 years. These were updated, and prioritised using a ranking process, at the 18 community meetings held around the region as part of the planning process in October 2003 [ref 10].

- Cross-border and inter-regional issues - from ongoing discussions with surrounding NRM bodies, in particular the downstream SA Rangelands INRM Group⁴³. Central to continuing cross-border work are the efforts of the Cooper's Creek and Georgina Diamantina catchment committees.
- Priority actions - the above sources fed into the 'Planning Our Actions - Thinking About Targets' workshop held in Longreach in February 2004 (see Section 8.1 for more detail). The outcome of this workshop was a list of prioritised actions against each of the assets (for further information on the process and a complete listing of outcomes, see Communication Plan, available at www.dcq.org.au).

It must be stressed that these are proposed actions against the assets. The final actions funded through the regional process will be outlined in the Regional Investment Strategy which, by drawing on this plan, provides the details of the work to be undertaken, the resources required and the partnerships involved.

6.3 Our principles for action

A natural resource management body can act in several ways. The Desert Channels Queensland Regional Plan lists five modes of action:

- 1) Maintaining leadership and momentum - developing a healthy community process, evaluating our progress, and being willing to change;
- 2) Building effective partnerships - bringing all sectors together to decide priorities and actions, and to deliver sustainable natural resource management;
- 3) Changing attitudes and actions - increasing the knowledge, skills, confidence and commitment of the community to sustainably manage natural resources;
- 4) Providing better information - improving the quality and usefulness of our knowledge and information and how we deliver it;
- 5) Strategic on-ground action - making a difference where it counts through cooperation and partnerships.

6.4 The Desert Channels assets and actions tables

This is the main part of the plan. It consists of a table of actions set against each of the four assets and the single, over-riding issue, weeds and feral animals⁴⁴. Each table lists the key threats to the asset (in the case of weeds and feral animals the threats are to the management of the issue) along with current and potential management actions.

The actions have been prioritised in line with the issues raised during the round of community meetings and the action-planning workshop. The number of stars indicates the rating the community gave to the issue. These ratings will help guide the development of the Regional Investment Strategy (RIS). Some actions will not stand alone but could be combined with others into larger investments (see Part D). Some

⁴³ See 'Part C'

⁴⁴ Weeds and feral animals impact so heavily across the assets of the DCQ region and the community of the region that this issue has been given separate treatment in the plan.

actions may not be funded by the Natural Heritage Trust, or have partners willing to undertake them at this time. Nonetheless they stand in the plan as potential areas of activity.

The RIS will determine which areas are likely to be invested in over the next three years. Investments being considered for the RIS at this time are indicated in the table by a 'RIS' in the priority column.

Also listed against the actions are potential partners. Negotiation with these partners will be an important part of developing the Regional Investment Strategy. Without strong partnerships some investments may not be possible.

Note: Where DCQ is indicated in the tables, it also covers the three implementation groups⁴⁵ of the region. For more detailed information on the assets and condition, see the Community Information Paper available at www.dcq.org.au.

Land

Geology, landforms and soils shape and support the pastures and other vegetation that determine the way we can productively use the land.

Aspirational target

That by 2050 the region's land resource and vegetation cover is managed in a sustainable manner for the ongoing benefit of the whole community and protection of the environmental values of the region.

2004 condition and trend

- Recent drought conditions have caused a decline in land condition, pastures and vegetation.
- Response of perennial pasture to recent rain has been sporadic in parts of the Mitchell Grass Downs and Desert Uplands.
- Vegetation thickening and/or encroachment are having an adverse impact on the structure (changing biodiversity) and pasture (reduced grazing potential) in a number of gidgee, mulga and eucalypt communities.
- Use of fire to manage vegetation is not common practice in many parts of the region (eg. the Mitchell Grass Downs).
- Recent assessment of land degradation is available in the Desert Uplands (condition generally good or better apart from some impacted sites) but information for the remainder of the region is dated and conflicting.
- There is a need to assess the current extent of degradation (soil condition, ground cover, and vegetation condition) and identify susceptible land types.
- Weeds of National Significance (WONS)⁴⁶ are impacting on land and vegetation cover across the region [ref 3].

⁴⁵ Desert Uplands Build-Up and Development Strategy Committee; Cooper's Creek Catchment Committee; Georgina Diamantina Catchment Committee

⁴⁶ Prickly acacia, parkinsonia, mesquite, and rubber vine

- State Rural Leasehold Land Strategy is emerging as a major driver of land management outcomes (majority of land in the region is leasehold).

Threats to the asset

- Lack of baseline information and monitoring at the regional scale.
- Climate variability (getting warmer and drier).
- Vegetation thickening.
- Exotic weed impacts.
- Total grazing pressure (includes macropod impact).
- Unsustainable grazing practices (not always recognised due to incremental change and masking by climate variability).
- High and rising land prices (relationship between land productivity/profitability and land price is poor).
- Increase in short term landholding (may have a lack of knowledge of the region or an interest in its future).
- Declining numbers of people working the land and increasing economic pressures may result in short-term decision making.
- Lack of regeneration of desirable pastures (caused by drought or grazing pressure).
- Lack of appropriate fire management techniques.
- Accelerated erosion (wind, water) caused by overgrazing, poor road/track construction practices and visitor pressures.
- Salinity (not immediate, will need to monitor, identify areas of risk).
- Lack of rehabilitation after small-scale mining and road building activities.
- Pollution (mining activity, chemical spills).
- Lack of community knowledge to manage land change impacts.
- Limited ability to engage landholders positively in current, uncertain climate of vegetation management.

Resource condition targets

- RCT 1.1 No net increase in the area of land identified as having a long term declining ground cover trend by 2015.
- RCT 1.2 By 2015 salinity risk is assessed in priority areas (to be determined).

Note: The diverse range of land-types, hugely variable climate, limited information base, and available monitoring techniques make it difficult to set robust resource condition targets for soil condition/groundcover at this time.

Management action targets (MATs)

- MAT 1.1 Develop scientifically sound, community accepted, and measurable soil condition/ground cover targets for the major land types of the region by 2008. This will involve the testing and refining of community accessible remote sensing techniques to assess ground cover in the region.
- MAT 1.2 Determine priority areas for salinity risk by 2007.
- MAT 1.3 Develop Best Management Practices (benchmarking and goals) for all major pasture types/ vegetation communities in the region by 2007 (includes fire management).
- MAT 1.4 Climate risk (including climate change) widely understood in the region by 2007, information delivered through Grazing Land Management (GLM) package.
- MAT 1.5 Land management capacity-building opportunities are provided to at least 350 grazing enterprises in the region by 2008 (primarily delivered by the Grazing Land Management (GLM) package).
- MAT 1.6 Make regionally appropriate information available on total grazing pressure to the region by 2007⁴⁷.
- MAT 1.7 Improve the condition of DCQ assets through integrated information delivery, on ground planning and action at 200 locations in the region by 2007 ('Protecting our Future')⁴⁸.
- MAT 1.8 Have Best Management Practices⁴⁹ for planning, construction and rehabilitation of roads, tracks, borrow pits, and small-scale mining adopted by local government, State Government and miners in the region by 2007.

Other management action targets relevant to this asset:

- MAT 3.2 Monitor point-impacts on water quality (sewage inflows, livestock pressure, groundwater discharges, and tourism use) and determine best management practice for point-impact pollution by 2007.
- MAT 3.3 Progressively set catchment-scale (and community-accepted) water quality targets based on best available information with indicative targets in 1 year, refined targets within 3 years and confirmed targets within 5 years.
- MAT 3.5 Climate risk (including climate change) impacts on catchment processes widely understood by 2008.
- MAT 3.11 Identify erosion processes/areas of risk that lead to increased streamline siltation by 2007 (linked to MAT 1.1)

⁴⁷ This target will be met through collaboration with surrounding regions.

⁴⁸ 'Protecting our Future' is an integrated, on-ground planning and action project spanning all assets.

⁴⁹ These will be developed by the relevant authorities; DCQ will only coordinate and provide leadership in this area.

- MAT 3.12 Scientifically sound and community accepted standards in place for assessing catchment health in place by 2006 ('Lake Eyre Basin Rivers Assessment'). (linked to MAT 3.3)

Table 4: Land

Threats	Management actions and targets addressed		Priority	Who
Unsustainable land management practices	L1	Through the development of Best Management Practices, promote a better understanding of climate and pasture cycles in the major pasture types (with reference to drought and climate change risks. Also linked to current DPI&F Mitchell grass recovery project). MAT 1.3, 1.4	*** RIS	DPI&F/NR&M
	L2	Survey region for salinity risk and make management recommendations for at risk areas. MAT 1.2	** RIS	DCQ, NR&M
	L3	Provide appropriate training on sustainable land management for the main land-types (Grazing Land Management). MAT 1.5	*** RIS	DPI&F
	L4	Research the impacts of floodplain grazing practices in the Channel Country and develop Best Management Practices. MAT 1.3, 1.4	Existing	DPI&F, MLA
	L5	Collate information and provide options to the community on appropriate ground cover targets for the major pasture types to achieve improved soil condition and biodiversity conservation. Includes further trialling of remote sensing. MAT 1.1	*** RIS	DCQ, DPI&F/NR&M, EPA, Landcare
	L6	Investigate wind erosion processes in susceptible land types in the Channel Country. MAT 1.1	Existing	GU
	L7	Develop information packages on the management of total grazing pressure (over all land-uses). MAT 1.6	*** RIS	DCQ, DPI&F/NR&M, EPA
	L8	Safe carrying capacity assessment made available to grazing enterprises (excluding Desert Uplands). MAT 1.3	**	DPI&F, MLA
	L9	Testing of safe carrying capacity assessment in the Desert Uplands. MAT 1.3	Existing	DPI&F, MLA
	L10	Deliver an integrated planning and on-ground action package to promote the adoption of sustainable land management practices (integrated with other assets 'Protecting our Future'). MAT 1.7	*** RIS	DCQ, DPI&F, NR&M, EPA
	L11	Test remote-sensed groundcover monitoring for parts of the region and consult with the community. MAT 1.1	Existing RIS	DCQ, NR&M, Landcare
Changes to vegetation communities	L12	Research woodland thickening / pasture processes and develop Best Management Practice for the on-going maintenance of gidgee and eucalypt woodlands. MAT 1.3, 1.5	*** RIS	DCQ DPI&F/NR&M, EPA
Unsustainable forest management	L13	Development of native forests/woodlands codes of practice. MAT 1.3	**	DCQ, DU, DPI, NR&M,

Threats	Management actions and targets addressed		Priority	Who
Land-use modification and rehabilitation	L14	Encourage the adoption of Best Management Practice guidelines for road and track construction, borrow pit, quarry, and land rehabilitation. MAT 1.8	**	DCQ, LG, MR
	L15	Provide NRM input into a regional sustainable tourism strategy to include the management of land degrading activities and site impacts. MAT 1.7	***	DCQ, EPA OQTA, RAPAD, LG
Lack of property planning	L16	Develop and promote the adoption of regional guidelines for property management plans that match land use/management practices to land capability/suitability. Encourage adoption of property management planning through making planning a component of on-ground works (L9). MAT 1.5, 1.7	*** RIS	DCQ, EPA, DPI&F/ NR&M
	L17	Provide access to region-wide land resource mapping, appropriate for property planning. MAT 1.7	** RIS	DCQ, EPA, NR&M
	L18	Provide land managers with the capacity and support to access and obtain relevant information, skills and advice to manage their land sustainably. (current Desert Uplands project, 'Desert Steps Ahead') MAT 1.7	Existing	DCQ, BDT, DPI&F, EPA DU
Inadequate cross-border frameworks	L19	Develop and maintain networks and partnerships with neighbouring states and regions to ensure frequent communication and cooperation (See Part C).	*** RIS	DCQ, NR&M, RINRMG, LCNT, WCMA, other NRM bodies

Weeds and feral animals⁵⁰

Invasive exotic species and other pest species that impact on the biodiversity, ecology, sustainable production and community of the region.

Aspirational target

By 2050, the biodiversity and productivity of the region has been enhanced, and the impact on ecosystems is reduced through continuing, strategic weed and feral animal management.

2004 condition and trend

- Region continues to be at threat from weed spread into and within the region.
- Declining numbers of people working the land and increasing economic pressures may result in short-term decision making. Some landholders do not recognise pest management as a priority in the face of other challenges.
- Major infestations of several Weeds of National Significance (WONS) in the north and east. Species such as prickly acacia have the potential to change the biodiversity and pasture productivity of much of the Mitchell grass downs if unchecked.
- Strong local government involvement in pest management planning and implementation. Local government activities are becoming more strategic through the establishment of, and ongoing support for, the Shire Rural Lands Officers Group of Western Queensland.
- Biocontrol measures have reduced the rate of spread of rubber vine and parkinsonia. Current efforts by the State Government are focussed on achieving biocontrol of prickly acacia.
- Large areas of the west and south are still free from major weeds.
- Containment lines have been identified for several WONS with strong emphasis on control outside these lines however, weeds such as prickly acacia, parkinsonia and mesquite are still spreading.
- Wild dogs are a significant threat to primary production and community sustainability in most parts. Major coordinated baiting campaigns now occurring.
- Cats and foxes impact on biodiversity across the region. Fox control has been locally effective in sheep areas but no baiting technology is currently available to deliver cat control.
- Cane toads are slowly moving into the region (10 to 20km/year). About 20% of the region may be infested.

⁵⁰ Weeds and feral animals impact so heavily across the assets of the DCQ region and the community of the region that this issue has been given separate treatment in the plan.

- Drought conditions have provided an opportunity to undertake strategic control of pigs, reducing the spread into the lower parts of the Channel Country.

Threats to the asset (in this case, contributing factors to the issue)

Weeds and ferals threaten each of the four assets of the region:

Land

Invasive weeds threaten native vegetation cover and exacerbate erosion.

Feral animals can reduce vegetation cover, cause erosion, and reduce sustainable grazing options.

Water

Weeds and feral animals (particularly pigs) alter the ecology of riparian areas and aquatic environments.

Feral animals impact on water quality.

Exotic aquatic species (e.g. water-weeds, fish, turtles) are a serious threat: they are often well-established before they are detected.

Biodiversity

Invasive weeds destroy the integrity of ecosystems e.g. prickly acacia on Mitchell grassland or rubber vine on riparian areas.

Feral animals impact on biodiversity e.g. cane toads reduce populations of predators; feral pigs damage and destroy riparian ecosystems; cats and foxes predate on a wide range of fauna; and starlings invade nest hollows used by native birds.

Community

Invasive weeds threaten financial returns from primary industry and may reduce the ability to invest and employ.

The same can be said of feral animals. For example, wild dogs reduce sheep numbers with resulting decline in employment and numbers of people available on property to attend to other natural resource management issues.

Issues identified in this area include:

- Lack of awareness regarding weeds (impacts, seed spread, new weed incursions).
- Lack of understanding of the NRM benefits (including biodiversity) from strategic weed and feral animal control by the broader community.
- Absentee landholders often do not see pest management as a priority.
- Apathy regarding weeds/ferals from some sections of the community.
- Poor follow-up on previous control work.
- Inflexible funding cycles (need to get funds on the ground quickly or when seasonal conditions are suitable).

The DCQ community has identified pest animals and plants as the greatest single threat to the region's assets; they impact directly on all four assets of the region.

Resource condition targets (in this case, issue condition target)

- RCT 2.1 Impact of priority weeds and feral animals on the land, water and biodiversity assets of the region contained (no further spread) by 2010 and reduced by 2015.
- RCT 2.2 Prevent 100% of new, priority weed and feral animal outbreaks from establishing within the region (within 2 years of identification, commencing 2005).

Management action targets (MATs)

- MAT 2.1 Develop and implement a regional containment and adaptive management strategy for WONS weed species by 2006 (consistent with national strategies). Reduce weed infestations consistent with this strategy by 2008.
- MAT 2.2 100% control of priority weed and feral animal outbreaks in the region is achieved within 2 years of identification.
- MAT 2.3 Develop and commence implementation of a regional strategy for weed and feral animal control by 2006. Reduce weed and feral animal infestations consistent with this strategy by 2008.
- MAT 2.4 Provide appropriate incentives for strategic and innovative management of weeds and feral animals as part of integrated on-ground action and planning 'Protecting our Future' by 2006.
- MAT 2.5 Develop (by 2005) and maintain a region-wide database and mapping capacity on weed and feral animal distribution and control (support community efforts to map pests in the region).
- MAT 2.6 Develop and implement a regional weed and feral animal management compliance strategy by 2006⁵¹.
- MAT 2.7 Ensure delivery to all sections of the community and visitors (industry, tourism) of appropriate pest identification, spread prevention and control information by 2006.

Other management action targets relevant to this issue:

- MAT 1.5 Land management capacity-building opportunities are provided to at least 80 grazing enterprises in the region by 2008 (primarily delivered by the Grazing Land Management (GLM) package).
- MAT 4.8 Obtain information on the impacts of weeds and feral animals on biodiversity and make this available through the GLM package by 2007.

⁵¹ This MAT is aimed at encouraging compliance with the control strategy (MAT 2.3) and relevant legislation.

Table 5: Weeds and feral animals

Threat	Management actions and targets addressed		Priority	Who
Inefficient leadership and coordination of strategic pest control in the region	P1	Continue support and development of the Cross Catchment Weeds and Feral Animals Initiative as the lead group for the delivery of weed and feral animal control programs. MAT 2.1, 2.2, 2.3	*** RIS	DCQ, NR&M, LG, RINRMG, LCNT, CCCC, GDCC, WCMA
	P2	Continue support for the Shire Rural Lands Officers Group of Western Queensland. MAT 2.1	*** RIS	LG, DCQ, NR&M, CCCC, GDCC
	P3	Develop appropriate policies/containment lines/buffer zones to support the strategic control of pests in the region. MAT 2.1, 2.3	*** RIS	DCQ, NR&M, LG, CCCC, GDCC
	P4	Support the initiatives of relevant national weeds management groups and the implementation of their strategic plans.	** RIS	DCQ
Inadequate information	P5	Provide a forum for an annual pest management debrief in the region to review containment strategies. MAT 2.1, 2.3, 2.4.	** RIS	DCQ, LG, NR&M, EPA, DPI&F, DWLBC, DEHSA, DIPE
	P6	Develop, keep updated and circulate a weeds and feral animals database for the region. MAT 2.5	** RIS	DCQ
	P7	Follow up outcomes from previous pest control projects in the region. MAT 2.5	**	DCQ, NR&M, LG
	P8	Promote 'best practice' weed and feral animal control techniques. MAT 2.3	Existing	DCQ, NR&M, LG
	P9	Development and promotion of best practice adaptive management techniques. MAT 2.1	**	DCQ, NR&M, SGC, NPBMG, RV&PMG
	P10	Hold workshops, field days, and excursions on all appropriate aspects of pest management. MAT 2.7	*** RIS	DCQ, NR&M, LG
	P11	Obtain information on the impacts of weeds and ferals on the biodiversity of the region. MAT 4.8	*** RIS	DCQ, EPA, CQU
Lack of on-ground control and effective enforcement	P12	Provide a coordinated approach to pest management compliance in the region. MAT 2.3, 2.6	*** RIS	LG, NR&M
	P13	Maintain 'Chemical Barrier' against wild dog incursions in the east of the region. MAT 2.3	Existing	NR&M, LG
	P14	Provide appropriate incentives for strategic control of pests through devolved grants and other measures (integrated with other assets 'Protecting our Future') MAT 2.4	** RIS	DCQ, NR&M, LG
	P15	Ensure follow-up to past pest control projects in the region. MAT 2.3	***	LG, NR&M

Threat	Management actions and targets addressed		Priority	Who
Inadequate measures to prevent pests spreading into or becoming established in the region	P16	Provide information (through Weed Alert Program and targeted tourist information) on pest threats to the region. MAT 2.5, 2.7	*** RIS	DCQ, NR&M, LG
	P17	Develop a strategic approach to weed seed hygiene including the installation of wash-down facilities and policies/incentives to maximise their use. MAT 2.7.	** RIS	DCQ, NR&M, LG
Inadequate cross-border frameworks	P18	Exchange of weeds mapping data, control expertise and extension products across state borders and between regional groups. MAT 2.5 (see also Part C)	*** RIS	DCQ, NR&M, RINRMG, LCNT, WCMA, other NRM bodies
Lack of pest management planning	P19	Incorporate a high level of pest management into all property management planning. MAT 1.5, 2.4	** RIS	DCQ, NR&M, DPI&F, EPA, LG

Water

Aquatic ecosystems and associated catchment processes govern the quality and quantity of water available to support our biodiversity, productivity and communities.

Aspirational target

By 2050 the region's water quality and aquatic ecosystem health is stable or has improved.

2004 condition and trend

- No recent systematic survey available of wetland areas or riparian condition assessment.
- Many riparian areas adversely impacted by weeds and feral animals.
- Excessive stock pressure is impacting on some waterholes and riparian areas.
- Water quality is generally good but is threatened by point impacts such as town sewage, stock watering, groundwater discharges and visitor pressures.
- Artesian springs are inadequately protected and managed. Threats include loss of flows due to declining GAB pressure, feral animals and stock pressure.
- Limited number of in-stream storages (weirs) but most do not have structures to allow fish movement during low flows.
- Impact from noxious fish species is low at present (need for constant monitoring).
- No major water extractions, but urban and stock water demands in drought times can impact significantly on waterholes.
- Small scale irrigation at present (some sections of the community keen to pursue it).
- Lack of knowledge on true impacts of removing water, need for more research on aquatic ecosystem processes.

Threats to the asset

- Pollution (chemical, sewage discharge from towns, groundwater discharge).
- Inefficient water use (urban, stock and irrigation).
- Declining numbers of people working the land and increasing economic pressures may result in short-term decision making.
- Unsustainable grazing practices, especially in riparian areas (leading to stream-line siltation, nutrient accumulation, loss of vegetation and soil).
- Invasive species e.g. fish/aquatic plants, feral animal and weed.
- Barriers to fish movement during low flows.

- Lack of understanding in the community of aquatic ecosystem processes.
- Excessive water extraction during drought (pressure on refuges for biodiversity).
- Spread, via bore drains, of weeds, ferals and potential noxious fish, e.g. *Gambusia*.
- Loss of pressure in Great Artesian Basin.
- Poor management of mound springs (loss of biodiversity).
- Cumulative impact of water storage developments.

Resource condition targets

- RCT 3.1 By 2015 maintain the quantity and quality of catchment flows necessary to maintain ecosystem processes.
- RCT 3.2 At least 80% of Wetlands of National Significance, and all high priority artesian springs in the region are in good condition or better by 2015.

Note: Water quality across the region is generally good. The limited information base indicates considerable natural variation due to the extreme variability in catchment flows. Turbidity and salinity can be naturally high in some of the region's streams. Given the size of the region, and available resources, a region-wide monitoring system is unlikely in the near future. Development of robust water quality targets (flowing water) for the region will be the subject of a management action.

At this time it is not possible for DCQ to set bore capping and piping targets for the region. Current GAB priorities are not determined by DCQ and are often focussed outside the region where more effective pressure recovery and bore drain length reductions can be achieved.

Management action targets (MATs)

- MAT 3.1 Map wetland areas of the region by 2006 (in conjunction with the community). Develop a list of priority wetlands, management guidelines and information for the community.
- MAT 3.2 Monitor point-impacts on water quality (sewage inflows, livestock pressure, groundwater discharges, and tourism use) and determine best management practice for point-impact pollution by 2007.
- MAT 3.3 Progressively set catchment-scale (and community-accepted) water quality targets based on best available information with indicative targets in 1 year, refined targets within 3 years and confirmed targets within 5 years.
- MAT 3.4 Appropriate systems in place for monitoring stream flows and water quality in the region by 2007 (may include reactivation of gauging stations).
- MAT 3.5 Climate risk (including climate change) impacts on catchment processes widely understood by land management community by 2008.

- MAT 3.6 Provide information on wetlands best management practice linked to appropriate on-ground incentives to manage and restore wetland areas in the region by 2008. (see MAT 1.7) ('Protecting our Future' - linked to other assets).
- MAT 3.7 Best practice water use guidelines adopted by major stakeholders (DCQ, GAB, Local govt., industry groups) in the region by 2007.
- MAT 3.8 By 2007 there is effective integration between the work of DCQ and the Great Artesian Basin Sustainability Initiative (GABSI) to improve the management of the region's natural resources.
- MAT 3.9 By 2007 there is effective cooperation between DCQ and the State water management planning processes.
- MAT 3.10 High priority artesian spring ecosystems are adequately protected and managed through adoption of best management practices and voluntary agreements by 2007 (linked to MAT 4.4).
- MAT 3.11 Identify erosion processes/areas of risk that lead to increased streamline siltation by 2007 (connected to MAT 1.1)
- MAT 3.12 Scientifically sound and community accepted standards in place for assessing catchment health in place by 2006 ('Lake Eyre Basin Rivers Assessment') (linked to MAT 3.3).

Other management action targets relevant to this asset:

- MAT 1.1 Develop scientifically sound, community accepted, and measurable soil condition/ground cover targets for the major land types of the region by 2008. This will involve the testing and refining of community accessible remote sensing techniques to assess ground cover in the region.
- MAT 1.2 Develop Best Management Practices (benchmarking and goals) for all major pasture types/ vegetation communities in the region by 2007 (includes fire management).
- MAT 1.4 Land management capacity-building opportunities are provided to at least 20% of grazing enterprises in the region by 2008 (primarily delivered by the Grazing Land Management (GLM) package).
- MAT 1.6 Improve the condition of DCQ assets through integrated information delivery, on ground planning and action at 200 locations in the region by 2007 ('Protecting our Future').

Table 6: Water and aquatic ecosystems

Threat	Management actions and targets addressed		Priority	Who
Inefficient water use	W1	Develop regional Best Practice guidelines for the management of urban and rural water use and have them accepted and implemented by the community. MAT 3.7, 3.1	*** RIS	DCQ, NR&M, EPA, LG
	W2	Support GAB capping and piping to eliminate waste and restore pressure consistent with the GABSMP. MAT 3.8	***	DCQ, NR&E

Threat	Management actions and targets addressed		Priority	Who
	W3	Address regulatory impediments to and promote water reuse. MAT 3.7	**	DCQ, NR&M, LG
	W4	Investigate and promote low cost options for desalination of poor quality groundwater. MAT 3.7	**	DCQ, NR&M, LG
Impacts on water quality	W5	Targeted monitoring of water quality impacts (potential point sources of pollution). MAT 3.2	*** RIS	DCQ, NR&M
	W6	Develop resource condition targets for flowing water at defined points in the region. MAT 3.3	*** RIS	DCQ, EPA NR&M, DPI&F
	W7	Develop a better understanding of runoff; erosion processes and streamline siltation. To be linked to development of groundcover targets for the region. MAT 1.1, 3.3, 3.11	** RIS	DCQ, NR&M
Lack of knowledge / planning	W8	Provide an adequate stream flow monitoring system. MAT 3.4	*	NR&M
	W9	Ensure that the appropriate level of involvement and information on water planning and allocations is provided to the community. MAT 3.9	**	DCQ, NR&M
	W10	Review existing information on water and aquatic ecosystems and, where possible, make available in a useable form. MAT 3.1	** RIS	DCQ, NR&M, EPA
Inadequate institutional frameworks	W11	Develop and maintain networks and partnerships with neighbouring states, NRM regions, and GABSI to ensure effective cooperation on water issues (see Part C). MAT 3.8	*** RIS	DCQ, other regional bodies, NR&M, EPA
Inappropriate management of wetlands	W12	Map wetlands/springs and prioritise wetlands (based on criteria developed by DCQ). MAT 3.1	*** RIS	DCQ, EPA, NR&M, DPI&F
	W13	Work with GABSI to ensure bore capping and piping is linked to other NRM outcomes (with priority for protecting and restoring artesian spring flows). MAT 3.8	***	DCQ, NR&M, EPA
	W14	Provide on ground incentives for the protection of biodiversity in priority wetlands/springs and riparian areas through adoption of best management practices (integrated with other assets 'Protecting our Future'). MAT 3.6, 3.10, 4.4	*** RIS	DCQ, EPA, NR&M, DPI&F
	W15	Develop Best Management Practice for wetlands (rehabilitation of degraded areas (covered by W13). MAT 3.1, 3.6	** RIS	DCQ, OQTA, LG, DPI&F
Changes to catchment processes	W16	Develop a better understanding of potential impacts of climate change on catchment flows and incorporate this knowledge into water planning and use. MAT 3.5	*** RIS	DCQ, NR&M, DPI&F
	W17	Provide long term monitoring of catchment health through support for the Lake Eyre Basin Rivers Assessment process. MAT 3.12	*** RIS	LEB Ministerial Forum, DCQ, NR&M, EPA

Biodiversity

The rich diversity of our region's living things (from soil microbes to large mammals) supports productive ecosystems that provide us with the natural resources on which we depend.

Aspirational target

By 2050 all ecosystems in the region are well conserved; there is no net loss of native species in the region and ecosystem processes are well understood and managed.

2004 condition and trend

- Unique and diverse range of ecosystems (some are tolerant of high aridity; some rely on flooding of the vast floodplains).
- Integrity of most ecosystems is good.
- Desert Uplands bioregion is a declared 'biodiversity hotspot'.
- The limited information that exists on biodiversity values indicates that a significant part of the region's biodiversity is still intact.
- There are a number of species in the region that are endangered or vulnerable.
- In some ecosystems, there are trends showing decline.
- The greatest impacts on the biodiversity of the region are total grazing pressure and weed invasion.
- Macropod numbers inflated in parts of the region due to increased waters and removal of wild dogs. Impacts of this are most evident during drought.
- Key species and 'of concern' ecosystems still need to be identified and quantified.
- Broader community doesn't understand value of preserving 'on property' biodiversity, and the accompanying benefits to land and production.

Threats to the asset

- Weeds and feral animals.
- Inappropriate land clearing.
- Unsustainable grazing practices
- Declining numbers of people working the land and increasing economic pressures may result in short-term decision making.
- Increased area of the region subjected to grazing pressure due to improvements in water infrastructure (may impact on areas that are refuges for biodiversity).

- Lack of incentives to adopt best environmental practice and to encourage conservation agreements.
- Visitor impacts are not being adequately managed in some areas.
- Mining practices in sectors such as opal and gypsum where environmental compliance is low.
- Poor information base (need for complete surveys of ecosystems / flora / fauna).
- Refugia for some species are not well understood.
- Lack of understanding by community of the role of biodiversity an ecosystem functions (need better education/awareness).
- Ecosystems/species are most vulnerable during drought, which may be worsened by climate change.
- Climate change may reduce rainfall in the region and increase stress on ecosystems. Resilience of ecosystems to these threats is not well understood.

Resource condition targets

- RCT 4.1 By 2015 the extent of remnant native vegetation cover in the region has not dropped below the level measured in 2007.
- RCT 4.2 By 2015 adequate and representative samples of 80% of the regional ecosystems found in the region are protected on private or State land and these ecosystems are in good condition or better.
- RCT 4.3 By 2015 at least 1000 ha of regional ecosystems currently assessed as 'endangered' have improved in condition.
- RCT 4.4 By 2015 100% of known rare and threatened species in the region, subject to recovery plans, are protected by regionally implemented management plans.

Management action targets (MATs)

- MAT 4.1 Regional ecosystem mapping completed by 2007.
- MAT 4.2 Regional ecosystems are adequately conserved by 2009.
- MAT 4.3 Systematic surveys and biodiversity audits are undertaken in targeted areas by 2007.
- MAT 4.4 Ecosystems on private land are conserved through adoption of best management practices and voluntary agreements - 250,000 ha in place by 2007 (consistent with regional priorities).
- MAT 4.5 Develop education/awareness packages for the community on biodiversity values and landscapes by 2007 (recognise prior achievements).

- MAT 4.6 Develop benchmarks for managing biodiversity condition and management to be incorporated into the GLM package by 2006 (linked to MAT 1.5).
- MAT 4.7 Review existing recovery plans, and develop and implement regionally relevant management actions for at least 80% of threatened species in the region by 2009 (will utilise outcomes from MAT 4.3).
- MAT 4.8 Obtain information on the impacts of weeds and feral animals on biodiversity and make this available through the GLM package by 2007.

Other management action targets relevant to this asset:

- MAT 1.1 Develop scientifically sound, community accepted, and measurable soil condition/ground cover targets for the major land types of the region by 2008. This will involve the testing and refining of community accessible remote sensing techniques to assess ground cover in the region.
- MAT 1.2 Develop Best Management Practices (benchmarking and goals) for all major pasture types/ vegetation communities in the region by 2007 (includes fire management).
- MAT 1.4 Land management capacity-building opportunities are provided to at least 20% of grazing enterprises in the region by 2008 (primarily delivered by the Grazing Land Management (GLM) package).
- MAT 1.5 Make regionally appropriate information available on total grazing pressure to the region by 2007⁵².
- MAT 1.6 Improve the condition of DCQ assets through integrated information delivery, on ground planning and action at 200 locations in the region by 2007 ('Protecting our Future')⁵³.
- MAT 1.7 Have Best Management Practices for planning, construction and rehabilitation of roads, tracks, borrow pits, and small-scale mining adopted by major stakeholder groups in the region by 2007.
- MAT 3.10 High priority artesian spring ecosystems are adequately protected and managed through adoption of best management practices and voluntary agreements by 2007.

Table 7: Biodiversity and ecosystem processes

Threat	Management actions and targets addressed		Priority	Who
Lack of information	B1	Investigate by field surveys, specific habitat and ecosystem needs of up to 5 identified priority rare/threatened species and/or 5 identified priority areas. MAT 4.3	**	EPA
	B2	Provide education and awareness on the role of biodiversity in the landscape. MAT 4.5	** RIS	DCQ, EPA

⁵² This target will be met through collaboration with surrounding regions.

⁵³ 'Protecting our Future' is an integrated, on-ground planning and action project spanning all assets.

Threat	Management actions and targets addressed		Priority	Who
	B3	Complete Regional Ecosystem Mapping. MAT 4.1	*** RIS	EPA
	B5	Review existing information on biodiversity and make available in a useable form. MAT 4.5	** RIS	EPA, DCQ
	B6	Develop information / research effects of exotic pests on the biodiversity of the region. MAT 4.8	*** RIS	EPA, DCQ, CQU
	B7	Develop benchmarks for biodiversity condition to be incorporated into the GLM land condition assessment. MAT 4.6	*** RIS	DCQ, EPA, NR&M, DPI&F
	B8	Arid Rivers Natural & Cultural Heritage Project	Existing	DCQ, RINRMG
Lack of on ground protection and management	B9	Provide an incentive scheme for protection of biodiversity and/or ecosystems (integrated with other assets 'Protecting our Future'). MAT 1.7, 4.2	*** RIS	DCQ, EPA
	B10	Provide on-ground incentives for protection of biodiversity and/or ecosystems in the Desert Uplands (biodiversity hotspot). MAT 1.7, 4.2	Existing	DU, BDT
	B11	Develop Best Management Practices for biodiversity management on grazing land. MAT 1.1, 1.5, 1.7, 4.6	** RIS	DCQ, EPA
	B12	Recognise and support existing community work on biodiversity conservation. MAT 4.5	**	DCQ, EPA, Landcare
	B13	Identify priority areas and encourage landholders to take part in voluntary nature conservation agreements ⁵⁴ . MAT 4.4	**	EPA, GA, NR&M
Lack of appropriate planning	B14	Provide Best Practice guidelines for managing tourism impacts on biodiversity and ecosystems. MAT 4.6	** RIS	DCQ, EPA, OQTA, LG
	B15	Review existing recovery plans and level of support for threatened species. Develop and implement management plans where necessary. MAT 4.7	** RIS	DCQ, EPA
	B16	Establishing east/west vegetation corridors in the southern Desert Uplands (market-based incentives)	Existing	DU, EPA, CQU
Ecologically invasive pest species	B17	Develop a better understanding of the impacts of excessive numbers of native animals (kangaroos) and weeds and feral animals on biodiversity and ecosystem processes (see also L7). MAT 1.6	**	DCQ, EPA, NR&M, Landcare
Inadequate cross border exchange of information	B18	Develop and maintain networks and partnerships with neighbouring states and regions to ensure complementary actions and exchange of information on biodiversity and ecological processes (see Part C).	***	DCQ, NR&M, RINRMG, LCNT, WCMA, other NRM bodies

⁵⁴ For example: Land for Wildlife and Vegetation Incentives Package.

Community

A well-informed, resourced and motivated community will wisely manage its natural resources, heritage and institutions.

Aspirational target

By 2050 the region's community is well-informed and has the capacity to manage the region's natural resources in a sustainable way.

2004 condition and trend

- Declining population across the region. Some communities have been significantly impacted through declining employment opportunities with the shift from sheep to cattle.
- Lack of information (education/awareness is critical to engaging broader community).
- Reduction in Landcare group activity across the region due to drought and lack of funding opportunities.
- Lack of engagement of the Indigenous community in the area of natural resource management (see Indigenous land management and heritage).
- Regional NRM process is not widely known or understood.
- Concern that regional NRM groups are 'big brother' and will regulate/legislate.
- Local government becoming more active in NRM (pest control, stock routes, planning, water and waste management).
- Community of the region continues to rely on effective partnerships with government to deliver technical support and project management.
- Non-Indigenous heritage of the region is well understood and promoted through the establishment of dedicated facilities (e.g. Australian Stockman's Hall of Fame, Waltzing Matilda Centre).

Threats to the asset

- Lack of engagement
- Misconceptions about NRM and regional bodies
- Lack of funding opportunities
- Lack of economic and social opportunities
- Enterprise viability
- Drought management policies and practices
- Population drift from the region
- Ageing population (especially among land managers)
- Reductions in government services
- Capacity of local government to deal with issues previously seen as State Government business.

- Lack of understanding of Indigenous heritage (see Indigenous Land Management and Heritage).

Resource condition targets

- RCT 5.1 By 2015 the community is effectively informed and engaged in the management of their natural resources.
- RCT 5.2 By 2015 there is a fully integrated (social, economic and natural resource management) and implemented planning process in place for the region.

Management action targets (MATs)

- MAT 5.1 Have information packages on the sustainable management of the natural resources of the region developed and distributed to the community by 2007.
- MAT 5.2 Ensure active community involvement in NRM planning and action by 2007 through support for the DCQ Board, Cooper's Creek Catchment, Georgina Diamantina Catchment and Desert Uplands committees and other NRM groups in the region in a healthy partnership with governments (federal, state and local).
- MAT 5.3 Have NRM issues recognised in planning for tourism development and management of the region by 2006.
- MAT 5.4 Undertake a socio/economic study of the constraints on the management of the region's natural resources by 2006.
- MAT 5.5 Sound links between DCQ and key groups (e.g. AgForce, WQLGA, RAPAD, OQTA) in place by 2006.
- MAT 5.6 Develop a regional waste management strategy by 2007.

Other management action targets relevant to this asset:

- MAT 1.4 Land management capacity-building opportunities are provided to at least 20% of grazing enterprises in the region by 2008 (primarily delivered by the Grazing Land Management (GLM) package).
- MAT 1.6 Improve the condition of DCQ assets through integrated information delivery, on ground planning and action at 200 locations in the region by 2007 ('Protecting our Future')⁵⁵.

⁵⁵ 'Protecting our Future' is an integrated, on-ground planning and action project spanning all assets.

Table 8: Community

Threat	Management actions and targets addressed		Priority	Who
Ineffective leadership and engagement of the community	C1	Provide support to DCQ Board and implementation groups. Ensure they are representative, capable, active, well resourced and supported by effective partnerships with all levels of government. MAT 5.2	*** RIS	DCQ, NR&M
	C2	Investigate incentives/disincentives for community involvement in NRM and adoption of sustainable land management practices.	** RIS	DCQ, NR&M BDT, DPI&F
	C3	Provide support through devolved grants and capacity building to reinvigorate and engage community groups. MAT 5.2	** RIS	DCQ, Landcare
	C4	Engage external key players to provide a mentoring role.	*	DCQ
Economic development not adequately addressing NRM sustainability	C5	Develop a strong partnership between DCQ Board, industry, local government, economic development, and tourism. MAT 5.3, 5.5	*** RIS	DCQ, RAPAD
	C6	Support the development of a regional strategy for sustainable tourism. MAT 5.4	*** RIS	DCQ, OQTA, RAPAD, UCQ, UQ
	C7	Investigate NRM implications of industry change in the region (sheep to cattle) Linked to 'Changes in Social Fabric' study (UCQ/UQ). MAT 5.4	** RIS	DCQ, DPI&F, NR&M, RAPAD, LG, UQ, UCQ
	C8	Develop a regional waste management strategy. MAT 5.6	*	DCQ, EPA, RAPAD, LG
Inadequate cross-border frameworks	C9	Develop and maintain networks and partnerships with neighbouring states and regions to ensure frequent communication and cooperation (complementary planning and activity) see Part C.	*** RIS	DCQ, NR&M, RINRMG, LCNT, WCMA, other NRM bodies
Inadequate planning	C10	Ensure regional NRM and economic plans are regularly reviewed, integrated, and owned by the community. MAT 5.2	*** RIS	DCQ, RAPAD
Lack of information and skills	C11	Develop information packages (paper, web) targeted at schools, land managers, townspeople and tourists on the region's natural resources. MAT 5.1	*	DCQ, DPI&F, NR&M, LG
	C12	Promote the good management of DCQ's natural resources outside the region.	**	DCQ
	C13	Investigate a placement program for new NRM graduates.	*	DCQ, NR&M, DPI&F, EPA, LG
	C14	Collect and manage data to develop regionally relevant information products.	** RIS	DCQ
	C15	Ensure the community can capably monitor and record the condition of the natural resources of the region.	**	DCQ, NR&M, DPI&F, EPA, LG
	C16	Provide workshops and field days to develop the community's capacity to make wise NRM management decisions.	*** RIS	DCQ

Indigenous land management and heritage

Aspirational target

Indigenous land management and heritage in the region are valued, well recorded and conserved by 2050.

2004 condition and trend

- Indigenous community is fragmented in much of the region and is poorly engaged in NRM.
- There is inadequate information and understanding of Indigenous cultural heritage.
- There is a common fear amongst landholders that Indigenous heritage assets are a liability, which may result in loss of control or interference with their land management.
- Partnerships in the community to manage cultural heritage are inadequately developed.

Threats to the asset

- Lack of understanding and confidence by the Indigenous community in the area of natural resource management. This is matched by a lack of understanding in the broader community of the potential benefits of Indigenous involvement in NRM.
- Lack of appreciation of or inadequate recording of heritage assets may result in loss or damage.
- The size of the region, small population and the vast number of heritage sites (both Indigenous and non-Indigenous) means that resources available for recording sites and managing them are limited.
- Difficulty in preventing unauthorised access to sites by tourists/visitors in such a vast landscape.

Resource condition targets

- RCT 6.1 The capacity of the Indigenous community to contribute to the management of the region's natural resources is enhanced by 2015.
- RCT 6.2 Indigenous issues and cultural heritage are dealt with effectively in the management of the region's natural resources by 2007.

Management action targets (MATs)

- MAT 6.1 Develop a database of traditional owners and historical custodians and foster and develop a DCQ Indigenous Leaders Group by 2007.
- MAT 6.2 Identify significant Indigenous areas / attributes / knowledge by 2007.
- MAT 6.3 Develop better relationships in the community with regard to Indigenous cultural heritage and incorporate Indigenous land management

techniques and knowledge into mainstream land management packages by 2007.

- MAT 6.4 Have Indigenous land management and cultural heritage issues incorporated into local government planning in at least two shires in the region by 2007.

Table 9: Indigenous land management and heritage

Threat	Management actions and targets addressed		Priority	Who
Lack of Indigenous involvement in NRM	I1	Develop an Indigenous Leaders Group for the region. MAT 6.1, 6.2	** RIS	DCQ, IG
	I2	Foster Indigenous/landholder relationships to better address NRM issues. MAT 6.3	** RIS	DCQ, IG
	I3	Ensure cultural heritage issues are adequately addressed in managing the region's natural resources. MAT 6.3	*** RIS	DCQ, EPA, IG
Poor protection of cultural heritage	I4	Develop a pilot project to integrate protection of Indigenous cultural heritage into local government land management. MAT 6.4	*** RIS	DCQ, LG, EPA, NR&M

Note: Desert Channels Queensland recognises that Indigenous engagement in the management of the region's natural resources is still at an early stage. This section will be reviewed following more extensive consultation with the Indigenous community.

PART C - Cross-border arrangements

7. The Lake Eyre Basin

The NHT2 arrangements clearly state that a regional body must take into account upstream and downstream impacts of any actions proposed when developing a natural resource management plan for their region.

The Desert Channels region is unique in Queensland in that it has both upstream and downstream cross-border neighbours: it is only one part of the Lake Eyre Basin. The Georgina River heads in the Northern Territory and is covered by the regional group, the Landcare Council of the Northern Territory (LCNT). The parts of the Cooper, Georgina and Diamantina catchments that extend into South Australia are covered by the Rangelands Integrated Natural Resource Management Group.

Under the Lake Eyre Basin Agreement [ref 7] there is an undertaking, supported by relevant legislation, between the governments of the Northern Territory⁵⁶, Queensland, South Australia, and the Commonwealth. This agreement, signed at Birdsville in October 2000, is about cooperation on the management of water and related natural resources across Northern Territory and Queensland sections of the Basin in addition to the catchments of the Cooper Creek and Georgina/Diamantina Rivers in South Australia⁵⁷.

The signing of the Lake Eyre Basin Agreement saw the formation of the Lake Eyre Basin Ministerial Forum which consists of the Commonwealth Environment Minister, Queensland Natural Resources Minister, South Australian Environment Minister and, more lately, the Northern Territory Minister for Central Australia. The development of its policies and strategies has occurred in parallel with the regional planning process. The actions in this plan are consistent with, and support, these policies and strategies.

To advise the relevant ministers, a Community Advisory Committee (CAC) and a Scientific Advisory Panel (SAP) were formed. Several members of the DCQ Board sit on the Community Advisory Committee thus providing close links between the two processes.

At the stage of writing this plan there have been initial discussions between DCQ and the LCNT. Given the early stages of the development of the Landcare Council of the Northern Territory (LCNT) this cooperation is in its infancy. There have also been discussions with the Western Catchment Management Authority of NSW on planning, information management and communication.

Desert Channels' most significant relationship is with the SA Rangelands INRM Group. As part of a shared vision for developing plans that have a common approach, the two bodies have agreed on a number of areas of cooperation, collaboration and information exchange. These cross-border arrangements have been depicted in a table (shown following) common to the plans of both groups. It indicates the relevant actions in each plan and the extent of the arrangements.

⁵⁶ Initially the Agreement area was the Queensland and South Australian portions of the Georgina, Diamantina and Cooper catchments. This was expanded to include the Northern Territory portion of the Basin when they signed the Agreement on 10th June 2004.

⁵⁷ The South Australian Government has given an undertaking to consult community and industry with a view to expanding the Agreement area in that state to include more of the LEB.

The DCQ region also shares much in common with other neighbouring NRM groups as outlined in section 5.5.

Table 10: Cross-border actions, SA & Qld

✓✓✓ joint action, ✓✓ complementary action, ✓ information exchange, X future collaboration.

Area of Action	SA Actions	Qld Actions	Nature of Collaboration	Notes
Pest plants and animals	B3.1, B3.2, B3.3	P1, P3, P5, P10, P17, P19	✓✓ to ✓✓✓	<i>Cross Catchment Weeds and Feral Animals Initiative</i> approved under the NHT Regional Competitive Component. Current complementary projects operating within each state.
Total grazing pressure	S1.1	L7	✓✓	Grazing management advice needs to be consistent
Ground water management	W1.1, W2.1	W2, W11	✓✓✓	GAB agreements including GABSI operating since 1999
Surface water management	W1.1, W1.2, W2.1	W1, W5, W7, W9, W10, W13, W14	✓✓	Water management plans being developed in both Queensland and South Australia
GAB springs conservation	W1.3, W2.5	W2, W12	✓✓	Linkage through a number of initiatives and research projects
Monitoring catchment health and setting targets	M1.1, W2.1	W5, W6	✓✓✓ to X	Outcomes from the LEB Rivers assessment and <i>Arid Rivers Natural & Cultural Heritage Program</i> will provide opportunities for future collaboration.
Ecological surveys	B1.4	B1, B8	✓✓✓	Arid Rivers Natural & Cultural Heritage Project addressing this in the Georgina, Diamantina and Cooper catchments
Biodiversity and Threatened species management	B1.3, B1.4, B2.1, B2.2	B7, B8, B13, B14, B15	✓✓ X	Actions complement each other but not necessarily related
Indigenous land management	H1.3, H2.3, C1.3	I2, I3	X	Through the LEB process, cross-border ties to be strengthened with Indigenous committees in both states and LEB.
Capacity building	C1.3, C2.2, C2.4	L3, C3	✓✓	Actions complement each other across boundaries (especially related with LEB process) but not necessarily related.
Ground cover monitoring and setting targets	M1.1, M1.2	L5, L9	✓	SA has considerable on ground data, Qld developing remote sensing capability.
Monitoring and evaluation	M1.1, M1.2	L5, W6	✓✓✓	Programs such as ACRIS developing systems for the entire rangelands

Area of Action	SA Actions	Qld Actions	Nature of Collaboration	Notes
Effective cross border frameworks	B21., B3.1, C1.3, C2.3	C9, L19, W10	✓✓ to ✓✓✓	<i>Cross Catchment Weeds and Feral Animals Initiative</i> and <i>Arid Rivers Natural & Cultural Heritage Program</i> both have Steering Committees with cross state membership.
Property management plans	S1.5	L17	✓✓	Actions complement each other but not necessarily related, scope for adopting other states' procedures.
Infrastructure and land use guidelines	S1.4	L14, L15	✓	Information exchange will enhance guidelines and give some consistency.

✓✓✓ joint action, ✓✓ complementary action, ✓ information exchange, X future collaboration.

Part D - Implementing the regional plan

The Desert Channels Plan indicates a number of areas where investment, either from the Natural Heritage Trust arrangements or other sources, is required to 'protect our assets' and make our region more sustainable into the future.

Through consultation with the community, combined with the information provided by our technical team, we have been able to make a number of suggested actions against each of the assets.

It is these actions and their relative priorities that feed into the development of the Regional Investment Strategy (RIS).

8. Plan consultation process and technical input

8.1 Priorities for investment

Each of the assets of the region is subject to threats, either current or emerging. Identifying these threats and dealing with the key issues the community has in managing them, form the basis for the DCQ priority actions. These priority actions were determined at the 'Planning our actions - thinking about targets' workshop held in February 2004.

Workshop groups had the opportunity to hear technical presentations on the current state and threats to the four assets (Land, Water, Biodiversity and Community) plus the issue, Weeds and Feral Animals. The technical presenters provided a list of actions to be considered. These were combined with further actions suggested by the workshop groups. Each group presented their top 4 or 5 actions. The top ranked actions of all the groups were combined to determine overall rankings. These rankings contributed to the assets tables in Part B.

The ranked actions are the foundation material for the plan and the Regional Investment Strategy (RIS). In the case of the RIS the community's preferred actions are assessed against the areas that NHT2 will fund, along with the potential resources and partners that might be available to the region.

The actions indicated against the assets in this plan do not necessarily stand alone as individual actions. In the first phase of the Natural Heritage Trust (NHT1) a wide range of investments were funded. Some of these were undertaken in isolation rather than in an integrated way. There was often not a clear picture of the regional priorities nor were actions focussed on the key threats to the natural resources of the region.

Under NHT2 the emphasis is on a strategic decision-making process which looks at tackling the key threats to the assets of the region in an integrated way, looking at causes rather than symptoms. A good example of this change in thinking is in the area of on-ground works. Under NHT1 the control of weeds, protection of biodiversity, or the enhancement of sustainable production, were often funded as separate projects. Under NHT2 these would most likely be wrapped together as an integrated investment to deliver outcomes against the three areas of NHT2 activity: protection of biodiversity, sustainable enterprises and capable communities. Like any investment it would be assessed in terms of the return it provides for the assets of the region.

The emphasis is on integration rather than acting in isolation. We need to ensure there is no duplication of effort and that actions are supported across the range of other planning initiatives be it water, vegetation, economic, social or local government.

As work on this plan winds up, the Regional Investment Strategy (RIS) is being pulled together. The RIS will take the priority actions from this plan and look at how to address them in an integrated way. It will consider the effectiveness of past actions and look at potential partners to get the job done, along with the timeframes required.

Innovative approaches to achieving more sustainable management of our natural resources are necessary. For example, rolling a range of on-ground actions into one integrated planning and action investment, 'Protecting our Future', will be a priority for the Desert Channels RIS.

Achieving broad change across the landscape will need stronger drivers than have traditionally been provided through the Natural Heritage Trust. Pilot market-based incentive projects such as the Desert Uplands East-West Linkages⁵⁸ may provide guidance in this area.

Not all the actions indicated in this plan will make it through to the RIS or be suitable for funding by NHT2. There may be other avenues to resource or encourage these actions.

We need to be realistic about how much NHT2 and our community can achieve. Some issues may be beyond our current resources or available technology. Of the region's modest population, only a small percentage is involved in NRM activities. This, coupled with the vast size of the region, is a significant constraint. A small regional group like Desert Channels Queensland has limited scope for undertaking projects (especially of a technical nature) on its own. This is where partnerships, particularly with state agencies, are critical to ensure the best available expertise, particularly in the area of science and extension. Local government will be a key on-ground action partner in the areas where it has responsibility such as weeds and feral animals, water and waste management.

The Regional Investment Strategy will outline the level of support required from NHT2, state and local governments, and the community, to achieve the outcomes sought.

Included in the RIS will be monitoring and evaluation of the outcomes of the plan. There will also be an assessment of the socio/economic impacts (if any) flowing from the investments proposed.

⁵⁸ Funded by the Department of Agriculture, Fisheries and Forestry.

Part E - Monitoring and evaluation

Appropriate monitoring, evaluation and reporting are vital to ensure the investments in the management of the natural resources of the region produce the outcomes we have planned.

Under the *National Framework for Natural Resource Management Standards and Targets* 'regional bodies are responsible for identifying relevant monitoring systems or establishing monitoring arrangements for both management actions/outputs and natural resource condition'.

There are two components of monitoring and evaluation:

1. Condition of the region's assets (resource condition)
2. Reporting of progress against investments (management actions)

9. Condition of the region's assets

Clearly in a large and remote region with limited access to monitoring expertise and a modest information base on the condition of the assets, there are significant challenges in putting the appropriate monitoring in place. It is not envisaged that DCQ will be responsible for monitoring or in some cases reporting on the condition of the region's assets (e.g. the 'State of the Environment' report provided by EPA). These tasks will be the responsibility of the relevant state agencies.

The following table shows the providers of information vital to the monitoring of our region.

Table 11: Main custodians of natural resource management data

Dataset	Organisation
Socio-economic data	Office of Economic and Statistical Research (OESR) Australian Bureau of Statistics Department of Local Government and Planning (DLGP) Rural Communities, DPI&F
Heritage	EPA, NR&M
Landscape attributes and land use mapping	EPA, NR&M, DLGP, Local Govt
Rainfall and climate	Bureau of Meteorology, Centre for Climate Applications
Surface water flows, allocation and transfers	NR&M
Groundwater availability and allocation	NR&M
Water consumption	NR&M, Local Government
Water quality	EPA, NR&M Local Government
Biodiversity and native vegetation	EPA, NR&M
Pest animal and plant infestations	NR&M, Local Govt, DCQ
Pasture cover and condition	NR&M, DPI&F, Centre for Climate Applications

At present the level of monitoring available in the region is limited in both space and time; brief visits to the region by monitoring staff provide a quick grab (maybe yearly) on the state of an asset at a few point sources (e.g. water quality). We have pockets of monitoring (e.g. groundcover) but there is no region-wide monitoring system for our assets.

Our region does not face these challenges alone. Other rangelands groups face similar problems as outlined in the plan of the Rangelands Integrated Natural Resource Management Group, our sister regional body downstream in SA: 'Suitable indicators, techniques, potential monitoring tools, and expert knowledge are all poorly known, not available, or not documented for the Australian Rangelands' [ref 27].

Given the size of the region, and modest database in some of these areas, there are currently significant constraints on the ability to monitor the condition of some of our assets. Remote sensed data capture will likely be necessary to get the information required over the region's 500,000 sq km. The highly variable climate and ecological response cycles of the region (typical of much of Australia's arid rangelands) means such monitoring will need to be in place over an appropriate period of time to determine any significant changes.

A good example is the area of groundcover where at present the monitoring technology is in prototype form under development by NR&M. Ground-truthing this monitoring in partnership with the community is a current DCQ project in the northeast part of the region.

Remote sensed data, through the SLATS project [ref 20], has been available for some time on the issue of tree cover. This information has been a vital part of the Regional Vegetation Management Planning process.

Other areas are more difficult. Water-quality in the region, for example, has a modest dataset captured over short time periods. The information is useful in that it indicates the significant variability in quality that may be expected in a catchment with such variable flows, but statistically, is of limited value. The current state-level water-quality monitoring is limited to a few point sources annually and, unless significantly expanded, cannot be relied on for water-quality monitoring under this plan.

There are some areas where DCQ has access to a reasonable database. The Cross-Catchment Weeds and Feral Animals Initiative has developed a good pest database through partnership with the Shire Rural Lands Officers Group and NR&M.

The level of monitoring of the natural resources of the region will determine the areas where robust resource condition targets can be applied. DCQ is unlikely to have the resources to undertake this monitoring. Negotiations with our partners are required to ensure the appropriate level of monitoring is in place.

10. Reporting of progress against investments

It is in the area of management actions and financial performance that DCQ is responsible for putting in place an appropriate reporting framework.

This will include:

Quarterly Financial Reports providing regular and consistent financial reporting to investors on actions and expenditure.

Bi-annual Progress Reports providing regular and consistent performance reporting on outputs and their contribution towards identified management action targets.

Annual Reports providing investors with outputs achieved and progress towards resource condition targets. Resource condition reporting may be limited initially but will expand over time as resource condition monitoring programs become established.

Annual reviews of investments will provide an opportunity to deal with any issues relating to the progress of the management actions.

The reporting framework for proposed investments will be fully outlined in the Regional Investment Strategy (RIS) which, when developed, will be attached to this plan.

Acronyms and abbreviations

ABS	Australian Bureau of Statistics
AQIS	Australian Quarantine and Inspection Service
ARIDFLO	Environmental Flow Requirements for Australian Arid Zone Rivers Project
BDT	Burdekin Dry Tropics
BOM	Bureau of Meteorology
CCCC	Cooper Creek Catchment Committee
CIP	Community Information Paper
CQU	Central Queensland University
CSIRO	Commonwealth Scientific Industrial Research Organisation
DCQ	Desert Channels Queensland Inc.
DWLBC	Department of Water, Land and Biodiversity Conservation
DPI	Department of Primary Industries
DPI&F	Department of Primary Industries and Fisheries
DU	Desert Uplands
DUBUDSC	Desert Uplands Build-Up and Development Strategy Committee
EPA	Environment Protection Authority
GAB	Great Artesian Basin
GABSI	Great Artesian Basin Strategic Initiative
GDCC	Georgina Diamantina Catchment Committee
GLM	Grazing Land Management
GU	Griffith University
IG	Indigenous Groups
INRM	Integrated Natural Resource Management
LEB	Lake Eyre Basin
LEBCG	Lake Eyre Basin Coordinating Group
LCNT	Landcare Council of the Northern Territory
LG	Local Government
MLA	Meat and Livestock Australia
MAT	Management Action Target
NAP	National Action Plan
NAPSWQ	National Action Plan for Salinity and Water Quality

NHT2	National Heritage Trust 2
NPBMG	National Prickle Bush Management Group
NRM	Natural Resource Management
NR&M	Natural Resources and Mines
OQTA	Outback Queensland Tourism Association
QPWS	Queensland Parks Wildlife Service
RAPAD	Central Western Queensland Remote Area Planning and Development Board
RCT	Resource Condition Target
RINRMG	Rangelands Integrated Natural Resource Management Group
RV&PMG	Rubber Vine and Parthenium Management Group
SLATS	Statewide Landcover and Trees Study
SGC	Southern Gulf Catchments
SOI	Southern Oscillation Index
SWNRM	South West Natural Resource Management
TAFE	Tertiary and Further Education
UQ	University of Queensland
WARLUS	Western Arid Region Land Use Study
WMCA	Western Catchment Management Authority
WONS	Weeds of National Significance
WQLGA	Western Queensland Local Government Association

References

1. ARIDFLO, (2002), *Biological and Hydrological Information Booklets, Thomson River Reach, Lower Cooper Creek Reach and Upper Diamantina Reach*. Department of Land Water and Biodiversity Conservation, Environmental Protection Agency, Queensland and South Australian Government.
2. Australian Bureau of Statistics, 2001 Census Basic Community Profile and Snapshot 3 Queensland, Aramac, Barcaldine, Barcoo, Blackall, Boulia, Diamantina, Ilfracombe, Isisford, Longreach, Tambo and Winton Shires, Australia Now 2 Australian Social Trends Population - Population Distribution: Population characteristics and remoteness, www.abs.gov.au
3. Australian Weeds Committee, *Weeds of National Significance*, <http://www.weeds.org.au/natsig.htm>
4. Bailey, V. (2001), *Western Streams Water Quality Monitoring Project*, NRM Brisbane QNRM01076.
5. Cobon, D.H., and McKeon G.M. (2003), *Climate Change in Western Queensland - Case studies examining impacts on pasture growth, stocking rates and animal production, (in prep)*.
6. Commonwealth Bureau of Meteorology, *Australian Rainman CD ROM*.
7. Commonwealth of Australia, (1999) (with the State of Queensland and Government of South Australia), *Lake Eyre Basin Agreement - A Discussion Paper for Community Consultation*.
8. CSIRO, (2001), *Climate Change Projections for Australia*, www.dar.csiro.au/publications/projections2001.pdf
9. Desert Channels Queensland, (2003), *Community Information Paper*.
10. Desert Channels Queensland, (2004), *Communication Plan*.
11. Environment Australia (2001), *A Directory of Important Wetlands in Australia, Third Edition*. Environment Australia, Canberra.
12. March, N (2000), *Prickly Acacia Best Practice Manual*, State of Queensland (Department of Natural Resources and Mines).
13. Moffatt, A.G.I. (1987), *The Longreach Story, A History of Longreach and Shire*, Longreach Shire Council, Jacaranda Press.
14. Queensland Department of Primary Industries, (1980), *Western Arid Region Landuse Study Part II*, Technical Bulletin No. 22.
15. Queensland Department of Primary Industries, (1993), *The Condition of River Catchments in Queensland*.
16. Queensland Department of Natural Resources, (1997), *Lake Eyre Basin Queensland Water Resource Assessment Report*.
17. Queensland Department of Natural Resources, (1998), *Draft water management Plan for Cooper Creek - Information Paper*.

18. Queensland Department of Natural Resources, (2000), *Cooper Creek Water Management Plan*.
19. Queensland Department of Natural Resources and Mines (2002), *NRM facts: History of Rabbit Fences in Queensland*.
20. Queensland Department of Natural Resources and Mines (2003), *Land Cover Change in Queensland 1999-2001*, Statewide Landcover and Trees Study Report (SLATS).
21. Queensland Department of Natural Resources Mines and Energy (2004), *Water Resource Plan - Georgina and Diamantina*.
22. Queensland Department of Natural Resources and Mines (2003), *Draft regional Vegetation Management Plans: North West Highlands, Channel Country, North West Mitchell Grass Downs, South East Mitchell Grass Downs, Northern Desert Uplands, Southern Desert Uplands, Southern Brigalow Belt, Mulga Lands*.
23. Queensland Department of Natural Resources and Mines (2003), *Draft State Leasehold Land Strategy*.
24. RAPAD (Central Western Queensland Remote Area Planning and Development Board), *Central Western Queensland Regional Strategic Plan* (1995).
25. Sattler, P and Creighton, C. eds (2002), *Australian Terrestrial Biodiversity Assessment 2002, National Land and Water Resources Audit*, Environment Australia and Land & Water Australia, Canberra.
26. Sattler, P.S. and Williams R.D. (eds) (1999), *The Conservation Status of Queensland's Bioregional Ecosystems*, Environmental Protection Agency, Brisbane.
27. Smyth, A., C. James and G. Whiteman, 2003. *Biodiversity Monitoring in the Rangelands: A way forward*, Report to Environment Australia, Alice Springs.
28. Turner, E.J., McDonald, W.J.F., Ahern, C.R., Thomas, M.B. (1993), *Western Arid Region Landuse Study Part V*, Technical Bulletin No 30, Queensland Department of Primary Industries, Brisbane.
29. Wilson, P.R., Purdie, R.W., Ahern, C.R. (1990), *Western Arid Region Landuse Study Part VI*, Technical Bulletin No 28, Queensland Department of Primary Industries, Brisbane.