QMDC also has produced **publications** aimed at increasing the knowledge of the farming community, including:

* a soil pit handbook for use in technical assessments. Land use capability assessment procedures have been trialled for use in technical assessments;
* a Land Condition Monitoring manual which enables landholders to better understand land condition and address the issues identified through monitoring;
* a number of fact sheets* on subjects such as:
  - 'Addressing salinity in the Goondoola Basin'; and
  - 'Making spreader banks work on your land'.

Crops near Milmerran © QMDC

Targets addressed by this goal:

RCT1: By 2020, salinity impacts on specified assets (Table LS1) are reduced against baseline conditions set by 2008.

RCT 2: By 2020, salinity impacts in specified areas of high salinity hazard (Table LS2) are avoided or minimised.

RCT 3: By 2020, soil conditions is maintained or improved against a baseline set by 2008.

RCT 4: By 2020, soil degradation impacts have not increased against a baseline set by 2008.

(Associated MATs 6,8,10 & 11)

* Case studies and other QMDC publications may be accessed via the QMDC website at www.qmdc.org.au

GOAL 4: To develop partnerships so as to incorporate research and development findings into the adoption of improved practices.

Kioma Grain and Graze workshop participants © QMDC

Through a process of partnership development, QMDC has been able to implement research and development findings through existing delivery mechanisms, including:

* **Grain and Graze** - a joint QMDC-industry program, funded by Meat and Livestock Australia (MLA), Grains Research and Development Corporation (GRCD), Land and Water Australia (LWA) and the Australian Wool Initiative (AWI);
* Queensland's Primary Industry and Fisheries (QPIF) **Leygrain** workshops;
* **GLM** in the Border Rivers and Maranoa-Balonne catchments;
* a joint land and water management plan (LWMP) that was prepared in conjunction with **Growcom** for a grape grower in St George to confirm departmental standards and requirements;
* a collaboration between CSIRO and QMDC on a project titled **'Scenario Analysis of Grain and Graze Enterprises' (SAGGE)** where land use trade-offs were assessed against sustainability criteria and were informed by Agricultural Production Systems sIMulator (APSIM) and the GRASs* Production model (GRASP) modeling of scenarios;
* a joint project between QMDC and the former NRW that collected, interpreted and integrated land information from **Soil Reference Sites** to characterize representative landscapes for which information was previously inadequate or unavailable.

Targets addressed by this goal:

RCT1: By 2020, salinity impacts on specified assets (Table LS1) are reduced against baseline conditions set by 2008.

RCT 2: By 2020, salinity impacts in specified areas of high salinity hazard (Table LS2) are avoided or minimised.

RCT 3: By 2020, soil conditions is maintained or improved against a baseline set by 2008.

RCT 4: By 2020, soil degradation impacts have not increased against a baseline set by 2008.

(Associated MATs 6,8,9 & 17)

*GRASs Production model was developed by the former Queensland Department of Natural Resources and Mines, now the Department of Department of Environment and Resource Management (DERM).

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Front cover images: Landholder checking soil moisture in newly-sown saltbush seedlings; Queensland Blue grasslands; broadacre minimum-till planting; soil core sample; cotton crop © QMDC

QMDC COMMUNITY REPORT

Land and Soils

Land and soil assets of the region

The soils in the QMDC management area range from deep clay on productive agricultural floodplains, productive grazing plains to the south west and west to less productive shallow mountainous soils in the south east. These less productive soils are characterized by an older geological age, comparative low nutrition and marginal productive capacity.

Soil distribution has historically influenced land use across the region. Recent irrigation developments on the better soils and mining and energy sector exploration across all land uses and soils have changed growth directions.

Local agricultural industries are now beginning to adapt their risk responsiveness strategies to better manage prolonged dry seasonal conditions. The majority of the region now supports mixed farms where landholders change enterprise mix according to seasons and resource condition. This builds resilience against risk factors.

Grazing land management on either climatically marginal land or on fragile soils has received recent research and landholder interest.

Goondoola Basin landholder Jeff Betts sharing his experience in managing salinity with field day participants in 2008 © QMDC

The environmental, economic and social assets of the region have been categorised as:

* environmental assets (e.g. wetlands, fish, birds and native vegetation);
* economic assets (e.g. drinking water, productive land, built infrastructure, water for irrigation and stock, and tourist destinations); and
* social assets, (rural and regional communities, cultural sites and values and recreational areas).

Land and soil assets comprise part of each of these assets categories. A regional community needs all soils to be well managed and producing to their capacity in order to maintain economic wealth and to protect direct and indirect environmental values.

Key threats to land and soil assets

The threats to the region's land and soil assets include:

* declining land condition and productivity;
* nutrient run-down in pasture lands;
* land use beyond capability causing degradation;
* potential of remerging salinity if land use selection is not managed;
* poor knowledge and management of risks (economic and biophysical) in marginal environments (e.g. inappropriate land management practices with high failure rates); and
* inadequate monitoring of landscape processes.

*For more information regarding QMDC's Resource Condition Targets (RCTs) and Management Action Targets (MATs), please refer to the Regional NRM Plan accessed via www.qmdc.org.au

In order to assist the region's communities manage and adapt to these land asset risk factors, QMDC has been working with farmers, research and development (R&D) organisations and local governments.

Activities and achievements

This document summarises the range of achievements and activities conducted by QMDC's Land and Soils theme from January 2005 to June 2008 within the Maranoa-Balonne and Border Rivers catchments.

These activities are guided by the targets* contained in the Regional NRM Plan* and aim to maintain or improve land and soil assets and address the key threats through supporting landholders to achieve the following goals:

Goal 1: To **maintain and improve** land and soil condition.

Goal 2: To **protect** the environmental and social-economic assets from impact of salinity.

Goal 3: To **improve** knowledge within the farming community so as to better manage production and ecological risks.

Goal 4: To **develop** partnerships so as to incorporate research and development findings into the adoption of improved practices.

"Working together—healthy landscapes, viable communities"

QMDC has a range of processes to achieve these goals.

SUB-CATCHMENT PLANNING

A process involving landholders working together to identify natural resource management (NRM) issues and develop plans which integrate land, water, weeds and vegetation management at a landscape scale and identify local solutions.

During the period January 2005 to July 2008, there have 45 groups involved in the Sub-Catchment Planning (SCP) process. To date, 230 landholders in 32 SCP groups have received funding to implement their plans with on-ground works covering more that 1.6 million hectares, with 13 additional groups in the group planning stage.

SOIL TENDER

This tendering process aimed to improve soil condition by increasing existing groundcover to 30%, improving management of soil fertility decline and soil structure problems with an aim to reduce erosion.

ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)

This process involved landholders working to identify the severity and extent of risks. Several Traprock growers producing fine merino wool have undertaken significant EMS development in association with landholders in SCP areas.

STRATEGIC ALLIANCES WITH RESEARCH AND DEVELOPMENT ORGANISATIONS

Partnerships have been brokered with R&D organisations so that research findings from programs such as Grain and Graze (G&G) and Grazing Land Management (GLM) are implemented through established delivery processes and landholder groups. These projects focused on pasture selection, pasture establishment, rotational systems with cropping, water use efficiencies of systems and salinity management.

GOAL 1: To maintain and improve land and soil condition.

Through the **sub-catchment planning (SCP)** process, 148 landholders in 29 sub-catchment groups committed to the following **on-ground works** aimed at improving land and soil condition:

* 14,813 hectares of pasture established on degraded areas including the conversion to perennial pastures and deep-rooted plans to reduce salinity risk;
* 120 kilometers of on-ground soil works implemented (contour banks and waterway construction) protecting over 17,400 hectares from erosion;
* 16,459 hectares of earthworks, including pasture renovation, deep ripping and seeding;
* 135 alternative watering points constructed to more evenly distribute grazing pasture;
* 172 kilometers of fencing to land type constructed, protecting more than 82,720 hectares; and
* a total of 171,135 hectares identified as being under current recommended practice for land and salinity management with management agreements, including 27,177 hectares of salinity-affected land.

Additional QMDC activities which aimed to achieve this goal include:

* the engagement of two project officers to undertake **soil conservation** training through an ordered program and implemented in collaboration with experienced departmental officers;
* the **Soil Tender** process whereby 17 landholders submitted successful tenders, covering 6,861 hectares. The proposals targeted improved ground cover on both grazing and cropping lands;
* the support of **Landcare** coordinators and **technical officers** who conducted 270 workshops relating to SCP land management topics such as salinity, grazing management and soil conservation involving 2,865 landholders ;
* the application of findings from the Grain and Graze (G&G) program. The 2,500 participants in the G&G program planted pasture onto 19,500 hectares of degraded cropping land, and 5,000 hectares of cropping was treated with protective measures.

Targets addressed by this goal:

RCT1: By 2020, salinity impacts on specified assets (Table LS1) are reduced against baseline conditions set by 2008.

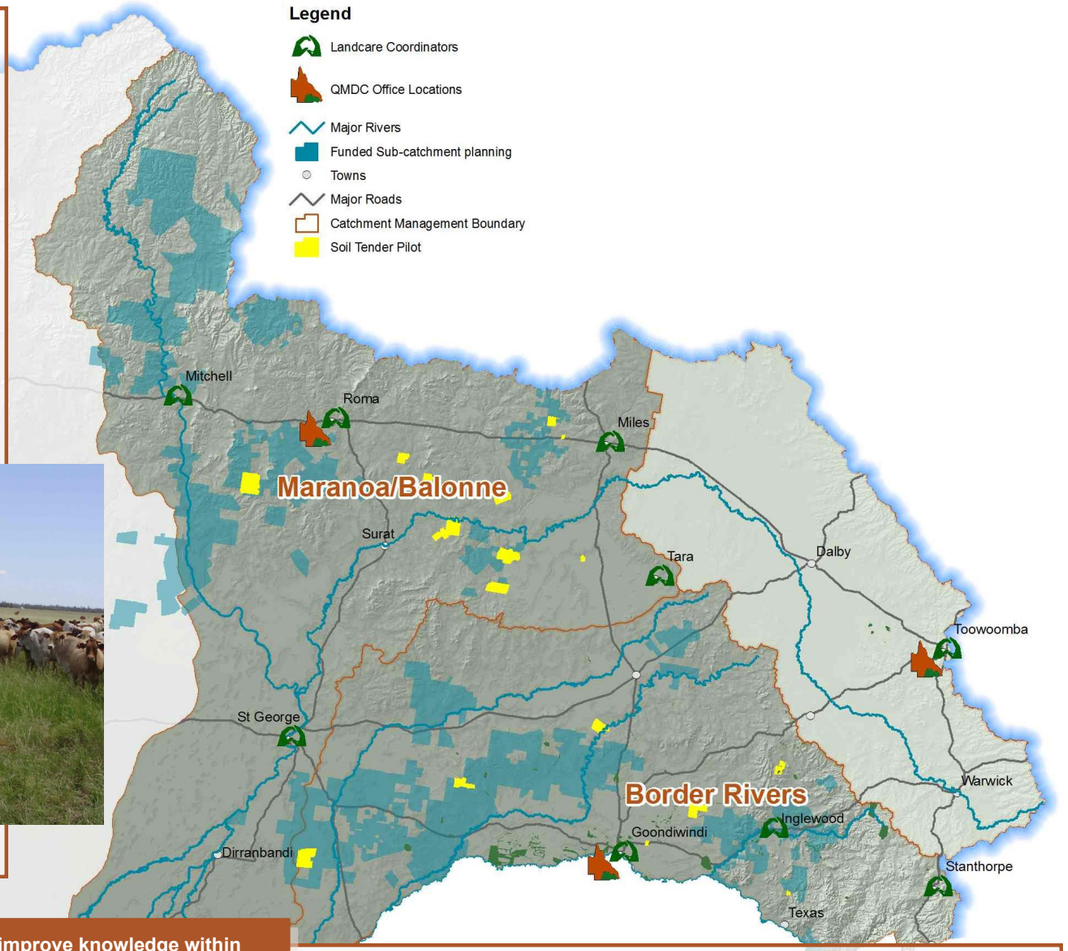
RCT 2: By 2020, salinity impacts in specified areas of high salinity hazard (Table LS2) are avoided or minimised.

RCT 3: By 2020, soil conditions is maintained or improved against a baseline set by 2008.

RCT 4: By 2020, soil degradation impacts have not increased against a baseline set by 2008.

(Associated MATs: 1,2 & 6)

Cattle on Queensland Bluegrass pasture © QMDC



GOAL 2: To protect the environmental and social-economic assets from impacts of salinity.

Many of the works mentioned under Goal 1 also contribute to this goal, since there are 27,177 hectares of land within sub-catchment planning groups that are in areas affected by salinity.

QMDC has focused activities in locations indicated by the salinity hazard mapping. The Goondoola project is a good example of landholder engagement resulting in land use change and land condition improvement. Two detailed **salinity risk studies** with recommendations for management change have been completed for Weengallon and Box Creek sub-catchment groups.

A Grazing Land Management (GLM) package has been developed for each of the Maranoa-Balonne and Border Rivers catchments. These packages inform landholders regarding understanding the grazing ecosystem, managing grazing and the tree-grass balance, using sown pasture, managing fire regimes and weeds.

Targets addressed by this goal:

RCT1: By 2020, salinity impacts on specified assets (Table LS1) are reduced against baseline conditions set by 2008.

RCT 2: By 2020, salinity impacts in specified areas of high salinity hazard (Table LS2) are avoided or minimised.

(Associated MATs: 3,4,1 5 & 16)

Broadacre minimum till planting © (Qld Primary Industries & Fisheries).

GOAL 3: To improve knowledge within the farming community so as to better manage production and ecological risks.

QMDC aimed to improve knowledge within the farming community though a variety of activities such as:

* conducting 51 **training workshops** for 483 participants including:
  - 10 Stocktake workshops;
  - 19 Leygrain workshops;
  - 6 Grain and Graze workshops; and
  - 8 Grazing Land Management workshops.
* the technical **assessments** conducted by QMDC staff for all sub-catchment planning groups as an on-going process to increase both organisational and landholder knowledge base. A good example is the case study investigating the impact of works undertaken to better manage salinity in the Goondoola Basin;
* the **Grain and Graze** program, resulting in research organisations applying their skills to investigate local issues and apply local solutions. It provided a vehicle whereby research elements were better linked to extension needs of landholders and the products developed were better targeted. Grain and Graze enables landholders to:
  - better manage feed supply and demand and enterprise mix to increase profitability;
  - improve crop and pasture rotation, including increased sowing of alternative pastures; and
  - adopt risk management.

There was also an associated improvement in the **technical skills** of both QMDC staff and landholders through involvement with Environmental Management System, Grain and Graze and Grazing Land Management delivery mechanisms.

Partnerships with other agencies also contributed to QMDC's ability to improve the knowledge within the farming community, including:

* the **salinity risk assessment** analysis by the former Queensland Department of Natural Resources and Water* which identified key risk areas where QMDC subsequently provided support to assist in the management of the salinity issue;
* a contribution to the production of five industry (grain/grazing/horticulture) **best management practice** (BMP) publications to better inform sub-catchment planning, in association with rural industry organisations; and
* a **groundwater scoping study** and a **deep drainage study** undertaken in collaboration with Cotton CRC, Cotton Research and Development Corporation (CRDC) and the (former) NRW to study high salinity risk areas of the catchment associated with irrigated cropping.

*Now the Department of Environment and Resource Management (DERM).