

# Guidelines for determining lease land condition – Queensland’s Delbessie Agreement (State Rural Leasehold Land Strategy)

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## Abstract

The “Guidelines for determining lease land condition” (the Guidelines) were developed by the Queensland Department of Environment and Resource Management (DERM) to support implementation of the Delbessie Agreement (State Rural Leasehold Land Strategy) which took effect from 1 January 2008. The Guidelines are designed around the eight elements of the Land Act 1994 ‘duty of care’ and defined elements of land degradation. They synthesise a range of accepted land management principles and practices into a defensible framework that can be applied consistently across Queensland, independent of climate and natural variability. The assessment of key indicators of long-term land condition is captured as a ‘point-in-time’ benchmark to guide future land management. On ground assessment is supported by leading remote sensing and modelling tools and supported by a suite of purpose-built IT applications.

## Introduction

The Delbessie Agreement is a long-term plan for securing the productive and environmental future of Queensland’s rural land and the vibrancy of the rural communities reliant upon it.

It represents a groundbreaking partnership between the Queensland Government, AgForce, and the Australian Rainforest Conservation Society. It is a contemporary plan for sustainable use, protection and rehabilitation of rural leasehold land that takes aspirations of leaseholders, conservation and Indigenous groups, government agencies and rural industry into account.

The Agreement uses a mix of incentives and regulatory approaches to support profitable and productive primary industry, while meeting natural resource management challenges (DERM, 2009). It applies to approximately 1800 rural leasehold land leases issued for grazing and agricultural purposes covering about 86.6M ha (or about 50% of Queensland's land area).

The Guidelines will be used by DERM officers to assess whether a lease is in 'good condition'. Additionally, the land condition assessment will inform statutory land management agreements (LMA's) that clearly outline leaseholders' natural resource management obligations.

The Guidelines build on the principles of the Land Act 1994 statutory duty of care and prevention of land degradation. Under this legislation, the duty of care sets out that a lessee must 'take all reasonable steps' to do the following:

- avoid causing or contributing to land salinity
- conserve soil
- conserve water resources
- protect riparian vegetation
- maintain pastures dominated by perennial and productive species
- maintain native grassland free of encroachment
- manage any declared pest
- conserve biodiversity.

The Guidelines provide a practical evidence-based approach to assessing, recording and monitoring land condition to improve knowledge and enhance property level planning. They provide the basis for:

- Determining the condition of the lease at a point in time
- Identifying land degradation issues on a lease
- Providing a sound basis for determining management outcomes and land management practices through land management agreements negotiated with lessees
- Providing a benchmark from which future land improvement outcomes can be measured
- Providing for adaptive management by monitoring the condition of land over time and allowing analysis to determine the success of different land management practices
- Allowing comparative analysis to determine long term trends at a regional or catchment level, in order to identify emerging issues
- Determining eligibility for extended lease terms

## Methods

The Guidelines have been developed around a framework of land condition 'Attributes' that reflects each duty of care provision, and 'Indicators' (within each attribute) of long term land condition. The 'key attributes' Pasture, Soil and Biodiversity are the primary determinants of land condition under the framework. The remaining attributes, Declared Pests, Salinity, Riparian vegetation and Natural water resources are also assessed, their condition recorded, and identified issues are addressed in the LMA for the lease (DERM 2009).

The Guidelines balance stakeholder expectations through integration of a range of science-based, and nationally and internationally accepted principles and methods, pertaining to land, biodiversity and grazing land management. The three key attributes draw on concepts, metrics and indicators adapted or abridged from practical applications including: Stocktake (Alexander et al 2009) and Grazing Land Management (Quirk et al 2007); Landscape Function Analysis (from Tongway 1994 and Tongway and Hindley 1995); and BioCondition (Eyre et al 2006). Methodologies and sampling protocols are adapted or drawn from national and international 'field' manuals such as McDonald et al (1990).

Land condition assessments are undertaken at the land type scale under the Guidelines. Land types of Queensland (Whish et al 2010) were developed by the Department of Employment, Economic Development and Innovation (DEEDI) in conjunction with land holders as part of the Grazing Land Management (GLM) program. This scale was selected as a recognisable management unit to landholders, and is considered an appropriate scale with which change can be detected and where management strategies are achievable to effect a change in condition. DERM has built upon this valuable resource of information sheets to create a state wide spatial dataset of land types (Qld GLM Land Types) correlated from Regional Ecosystems (RE) (Sattler and Williams 1999).

Site selection is determined through random selection based on a set of documented rules. Site assessment involves evaluating all seven attributes (where present), each of which has one or more condition indicators that must be assessed. At every site, the indicators (up to twenty- three) are rated (typically from 1 to 4) – 1 representing the ‘best’. A weighting has been applied to each indicator based on the Kepner-Tregoe Decision Making<sup>®</sup> methodology. The higher the weight of the indicator, the greater is its influence in the calculation of the attribute score.

On completion of the field assessment, attribute scores are calculated for assessment sites, individual land types, and overall across the lease. Each of the three key attributes (Pasture, Soil and Biodiversity) must be above a calibrated threshold for the lease to be considered in ‘good’ condition. Determination on the land condition is based on the lease as a whole, and considers the information reviewed during the desktop assessment, the site data collected, and observations made during the field inspection. While reporting is focussed on attributes and indicators at the site, land type, and lease scale, the ability to report at RE, sub-Bioregion and Bioregion scale exists.

The Guidelines are supported by a suite of innovative, purpose built IT applications designed by DERM in conjunction with ESRI Australia. These include desktop analysis and GIS tools built within the ESRI Dekho mapping tool; field site assessment tools (ESRI ArcPad); in-vehicle mobile data capture systems based on Hassett et al 2006 (ESRI ArcGIS); and a data management and reporting environment – Land And Resource Information Environment (LARIE). These applications allow data to be synchronised between desktop and field

applications and to support the creation, data capture, analysis, production and reporting of natural resource data across Queensland's rural leasehold estate.

The Guidelines outline the procedure for the desktop assessment and field inspection of the lease land, which is summarised as follows:

*Desktop Assessment:*

- Lessee engagement – provide advice and seek existing property management plans, infrastructure mapping etc.
- Data compilation and analysis – assemble digital data layers including land types, infrastructure and remote sensing products; determine Areas of Interest.
- Lease land stratification – map land types, determine land type composition and area.
- Site allocation process – the 'SiteGen' tool (created by Darr 2009) within Dekho, generates a pre-defined number of randomly located assessment sites per land type and lease; and applies infrastructure buffering rules to avoid unsuitable impacts (roads etc.).
- Contextual data analysis – determine spatial and temporal context for the lease using remote sensing and modelling products including: AussieGRASS Environmental Calculator (Carter et al 2000); Ground Cover Index (GCI) (Scarth et al 2006); FORAGE (Timmers et al 2008); Climate Risk Assessment (Zhang 2008).
- Inspection preparation – generate maps; synchronise data with field data capture software; confirm and invite lessee to attend inspection.

*Field Inspection:*

- Site assessments (at randomly generated sites) - data captured within a GPS and GIS enabled Personal Data Assistant (PDA)
  - the rating of each indicator for each attribute as outlined in the Guidelines
  - baseline data including: bioregion; land type; land use; dominant species of all strata; vegetation structure; tree basal area; ground cover; indigenous and other cultural heritage values; photographs

- Area of Interest inspections – photograph, record and/or assess known indigenous and other cultural heritage values; known significant natural environmental values; land degradation issues.
- Lease land observations –enter information about the condition and appropriate use of the land into GPS and GIS enabled, vehicle mounted laptop computer
- Issue noting – record any further issues of relevance for inclusion in the LMA.

## **Discussion**

The Delbessie Agreement aims to promote greater land management knowledge and understanding and strengthen capacity for a generation of land managers to adapt to future environmental challenges including climate change, while promoting goodwill between stakeholders. The process actively engages landholders through the condition assessment and negotiation of the LMA. Leaseholders are provided with the assessment findings including mapping and a range of lease specific resources to assist them in land management planning.

Land condition assessments under the Guidelines are designed to be consistent and repeatable. Analysis of land type, lease, catchment or regional data over time will provide better understanding of trends in rural land condition.

Where land is not in good condition at the commencement of the LMA, monitoring and regular review (at a minimum of 5 yearly intervals) will ensure that agreed management strategies are progressively improving condition and returning the land to a state capable of supporting long-term sustainable industry.

To date approximately 70 land condition assessments have been completed and associated LMA's under development. Feedback on the process has been positive with a high level of lessee engagement.

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## References

Alexander, J., and Paton, C. (2009) Stocktake – balancing supply and demand. Department of Employment, Economic Development and Innovation, Queensland Government, Brisbane.

Department of Environment and Resource Management (2009) Delbessie Agreement – Guidelines for determining lease land condition, Version 1.1, Queensland Government, Brisbane. <http://www.derm.qld.gov.au/>

Eyre, T.J., Kelly, A.L., and Neldner, V.J. (2006) BioCondition: a terrestrial vegetation condition assessment tool for biodiversity in Queensland, Field assessment manual, Version 1.6, Department of Environment and Resource Management, Queensland Government, Brisbane.

Hassett, R., Carter, J., Henry, B. (2006) Rapid Mobile Data Collection – A technique to monitor rangeland condition and provide quantitative and interpretive information for a range of applications. *Proceedings of the Australian Rangeland Society Conference*, Renmark, Australia.

McDonald, R.C., Isbell, R.F., Speight, J.G., Walker, J. & Hopkins, M.S. (eds.) (1990) *Australian soil and land survey - field handbook, 2nd ed.*, Department of Primary Industries and Energy and CSIRO, Canberra, Australia.

Quirk, M., and McIvor, J. (2007) *GLM Technical Manual*, Meat and Livestock Australia Limited.

Sattler, P.S., and Williams, R.D., (eds.) (1999) *The conservation status of Queensland's bioregional ecosystems*, Environmental Protection Agency, Queensland Government, Brisbane.

Scarth, P., Byrne, M., Danaher, T., Henry, B., Hassett, R., Carter, J., and Timmers, P. (2006) State of the paddock: monitoring condition and trend in groundcover across Queensland, *Proceedings from the 13th Australasian Remote Sensing and Photogrammetry Conference*, 20–24 Nov. Canberra.

Timmers, P., Zhang, B., Panjkov, A., Stone, G. and Day, K. (2008) FORAGE – A web-based framework for generating decision support information for sustainable grazing land management. *Proceedings of the Australian Rangeland Society Conference*. Charters Towers, Australia.

Tongway, D. (1994) *Rangeland soil condition assessment manual*, CSIRO, Australia.

Tongway, D., and Hindley, N. (1995) *Assessment of Soil Condition of Tropical Grasslands*, CSIRO Division of Wildlife and Ecology, Canberra.

Whish, G. (ed.) (2010) *Land types of Queensland*, Version 1.3., CD, Department of Employment, Economic Development and Innovation, Queensland Government, Brisbane.

Zhang, B. (2008) *Climate Risk Assessment Report*. Issued monthly. Queensland Climate Change Centre of Excellence, Department of Environment and Resource Management, Queensland Government, Brisbane.

Hassett, R., Peart, P., Bourne, G., Cannon, M. and Barber, D. (2010). Guidelines for determining lease land condition – Queensland's Delbessie Agreement (State Rural Leasehold Land Strategy). In: *Proceedings of the 16<sup>th</sup> Biennial Conference of the Australian Rangeland Society*, Bourke (Eds D.J. Eldridge and C. Waters) (Australian Rangeland Society: Perth).