BMRG
Ecosystem Resilience

2023

Land Condition Photo Standards for the Burnett River Catchment Area Grazing Lands

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Land type information was extracted from 'Land Types of Queensland – Inland and Coastal Burnett. Version 4.0' reproduced with permission of the Queensland Department of Agriculture and Fisheries - © The State of Queensland, Department of Agriculture and Fisheries 2023.

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The Burnett Mary Region

This land condition Photo Standards Guide was developed for rangelands within the Burnett River Catchment, Queensland, area which is part of the Burnett Mary region. The Burnett Mary region is located in south eastern Queensland, covering an area of approximately 56,000 km^2 of land and 11,000 km^2 of sea. The Burnett Mary Region is internationally renowned for its ecological diversity, extensive primary production and rich cultural heritage.

Introduction

This is a land condition tool for the grazing lands of the Burnett River Catchment, Queensland. Land condition is defined as 'the ability of land to respond to rain and produce useful forage'.

This land condition Photo Standards Guide provides examples of ABCD land condition for property scale monitoring by graziers.

The ABCD grazing land condition framework provides differentiation between land condition classes and has gained wide use in Queensland. There are four classes of land condition with 'A ' condition the best and 'D' condition the worst. This framework is based on grazing land ecology and relies on research from long-term grazing trials in Queensland. Land condition is defined as 'the ability of land to respond to rain and produce useful forage'.

Land condition is important because it underpins the productivity and profitability of the beef industry. Therefore, understanding land condition is critical for understanding the productive potential of the land, and is a basis for deciding when to make changes in management, e.g. alter stocking rates, introduce spelling practices and modify infrastructure for minimising damage to the natural resource. Explicit in the definition of good condition is the maintenance of ecosystem processes, such as water and nutrient cycling over variable periods of rainfall, resulting in stable pasture responses relative to the livestock carrying capacity.

Understanding The ABCD Framework

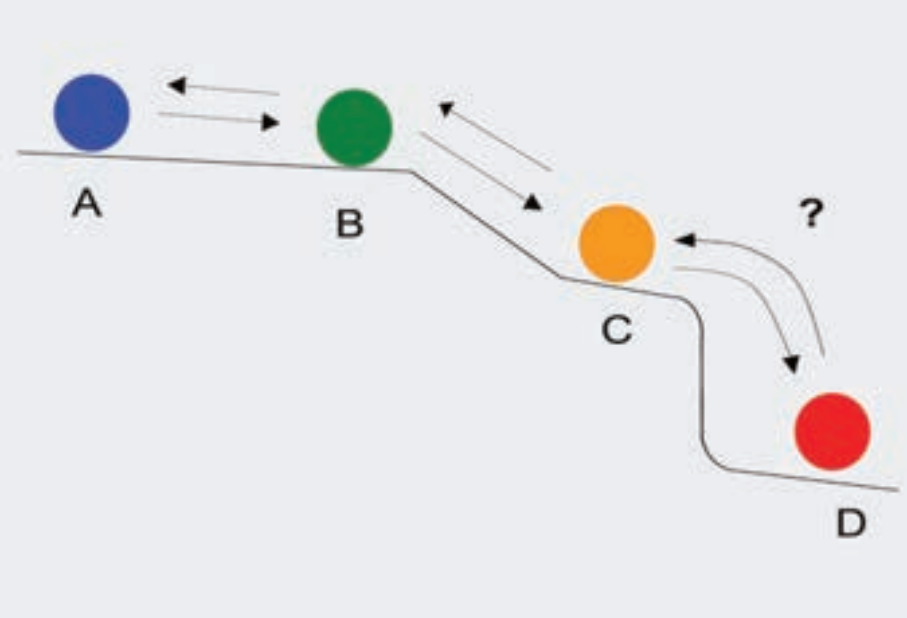
The rolling ball concept of land condition is useful for understanding the ABCD land condition framework. The text below has been summarised from the Meat and Livestock Australia EDGEnetwork® Grazing Land Management (GLM) Technical Manual (Quirk and McIvor 2003).

The ease with which changes in condition occur can be illustrated by representing land condition as a ball sitting on an incline.

Land in A condition is fairly stable. Land trending towards B condition can quickly revert back to A condition with a change in management.
Yet, land in B condition is susceptible to a quick decline to C condition. Reversing C condition to B condition may require a more significant change in management.
Land in C condition is susceptible to rapidly falling into D condition. D condition will not simply revert back to C condition with a change in management, at least not in time-frames of practical interest.
Normally reversing D condition will require major management action (e.g. mechanical or chemical); this is represented by the ball having 'fallen off' a steep gradient.

The challenge for assessors of land condition is to distinguish seasonal changes from real change. For example, A condition may appear to change to B condition during a run of dry years, but in reality maintains a good density of perennial plants and can quickly resume its 'classic' look of A condition with one good wet season. Furthermore, just because C condition land produces ground cover during a run of wet years, the reality is that, with lower densities of perennial pasture species, the land is less likely to be productive during a run of dry years and have longer recovery times following drought.

These concepts are covered in more detail in workshop training modules, such as GLM or Stocktake. For information on GLM and Stocktake workshops in Queensland, contact the Department of Agriculture and Fisheries.



Caption: The Rolling Ball concept of land condition (Adapted from Quirk and McIvor 2003).*

**Quirk, M.F. and McIvor J.G. (2003). Grazing land management — technical manual. Meat and Livestock Australia Limited, Sydney.*

Assessment Rationale

Land condition is a multifaceted assessment, not dependent on any one feature of a landscape. To arrive at a classification of A, B, C or D condition, consideration is made of the country's soil, pasture, weed and woodland components. The table below shows some of the key positive and negative features of these landscape components.

Landscape Quality Features		
Landscape Component	**Positive Qualities**	**Negative Qualities**
Soil	High levels of organic material and good soil structure	Erosion
Pasture	Density and coverage of preferred grasses (3P – perennial, productive, palatable)	Few preferred (3P) species
Weeds	No sign of weeds	Increasing weed density
Woodland	No sign or only early signs of woodland thickening	Increasing woody density

Assessment Rationale

In arriving at a classification of A, B, C or D condition, combinations of key positive and negative features of the landscape were assessed. The table below shows how a combination of positive and negative features of such components can contribute to an ABCD classification.

Condition Rating	
A	• High density and coverage of preferred (3P) grasses • High organic matter • No erosion
B	• Moderate density and coverage of preferred (3P) grasses or high density of intermediate grasses • Moderate organic matter
C	• Moderate to low density of preferred (3P) grasses or moderate density of intermediate grasses • Higher numbers of annual grasses and forbs, few weeds • Some erosion • Some woody thickening
D	• General lack of any perennial grasses or forbs • Severe erosion and large bare areas • High numbers of weeds/annuals • Thickets of woody plants covering much of the area

Site Assessment Criteria – Defined

Land type

Land type forms the structure for this guide. Arranged alphabetically, are 15 of the land types found in the Burnett River Catchment rangelands.

ABCD Rating

This land condition Photo Standards Guide presents as a set of four photos and associated text for each of the land types. These rank from A (the best) to D (the worst) condition and run left to right across the double-page layout.

Key Assessment Criteria

Explanation of the key criteria used in making A, B, C or D assessment are presented in the table below.

Assesment Criteria	Explanation
Plant species:	This is a list of the most common pasture plants present at the time of assessment which may be grazed by livestock in varying amounts. The most dominant species is listed first. It is not a complete list of plants. Common plant names for the Burnett are used and their corresponding scientific names are provide on page 15–16 along with their value as a pasture plant.
Weeds:	This is a list of the most common introduced weed plants in the site. It is not a complete list of weeds. Note: Australian native plants were not considered weeds in these assessments, although we acknowledge that undesirable native plants concentrated over an area can impede pasture production and therefore discount land condition.
Weed abundance:	This is an assessment of the amount of the introduced weeds in the site.
Pasture density:	This is a visual appraisal of pasture density. Density is presented in terms of the relative spacing between individual perennial pasture grasses that is expected for a particular land type.
Pasture TSDM (kg/ha):	This is a visual estimate of the yield of the pasture species in kilograms per hectare at the site. This is not an indicator of condition. It is calculated as total standing dry matter (TSDM).

Site Assessment Criteria – Defined

Assesment Criteria	Explanation
Proportion 3P grasses:	This is an estimate of the amount (volume) of 3P grasses in the site compared with other species. 3P grasses are perennial, productive and palatable. The density and coverage of 3P grasses is a key indicator of pasture condition.
Pasture condition:	This is an estimate of the state the pasture is in made by considering factors such as 3P grasses, ground cover, weed species and abundance, soil condition and considering how the pasture will respond to rainfall.
Ground cover:	This is an estimate of the total organic soil surface cover, including senescent and green grasses, forbs, low shrubs, cryptogams and litter. Note that bare ground includes bare soil, sand, gravel and rock. Ground cover can be a deceiving indicator of land condition, e.g. a very high level of ground cover when made up of annual species does not indicate good condition.
Soil condition:	This is an estimate of the stability and disturbance of the soil and is assessed as stable, slight disturbance, moderate disturbance, severe disturbance, very severe disturbance.
Land condition:	This is the land condition score (A, B, C or D) assessed at this site.
Woody vegetation:	This is a ranked list of up to the most common trees or shrubs visible in the assessment area, with the most dominant species in terms of basal area listed first.
Comments:	These provide insight into land condition rating decisions and specific site characteristics.

Collection Of The Photos

The intent of this guide was to provide a visual aid in the assessment of ABCD land condition classes in the Burnett River Catchment rangelands. This was done by capturing photos and data across the region, to act as standards for ABCD land condition assessments.

Photo standards were collected for 15 major land types found in the rangelands of the Burnett River Catchment. For each land type, a range of photos were taken to represent conditions that might be encountered on a pastoral property - whether grazed or ungrazed, weedy or non-weedy, or containing annual or perennial pastures.

For each rating (A, B, C or D), on each land type, a single photo was selected as a standard. The standard was selected as the 'best fit' to communicate the land condition rating at the time the assessment was conducted. As in all assessments of this type, no single photograph can capture the range of land condition alternatives possible. However, in some instances a standard depicted of one land type may be transferable to another.

For each land type, four colour photos are presented in sequence from left to right, or from A to D condition across a two-page spread. Supporting information of land condition attributes and ancillary descriptions of the site are also provided.

Description Of Plant Types And Forage Values

The type of plants observed at a site (i.e. annual, perennial, forb) are important in assessing land condition. In considering the land's ability to respond to rain and produce useful forage, perennial plants, especially grasses, are considered ideal. But not all perennial plants rank equally as useful forage.

The ranking of perennial pasture plants (in order of their forage value) into classes of preferred, intermediate and non-preferred species contributes to the final condition rating. In a few cases perennial grasses have a different forage value on a different land type. For example, Golden beard grass is a preferred (Pr) pasture plant on the Silver-leaved ironbark land type, yet an intermediate (Int) pasture plant on the Softwood scrub land type.

Forage Value Codes	
(Pr)	**Preferred** pasture species are generally those that are perennial, palatable and productive (3P), and often referred to as 'decreaser' or 'desirable'.
(Int)	**Intermediate** pasture species are perennial, yet not recognised as either preferred or non-preferred but rather in between. Feathertop rhodes grass (Chloris virgata) is an example of intermediate pasture in the Burnett region.
(N)	**Non-preferred** pasture species are perennial, yet not a weed and generally less palatable and productive than preferred pasture species.
Weed	A plant considered undesirable, growing where it is not wanted. Note: Australian native plants were not considered weeds in this guide, although it is recognised that native plants can become weeds when given the opportunity.
Plant types	
perennial	Perennial pasture plants live for more than a year and regenerate from tussocks as well as seed. Perennial plants are most persistent and resilient to grazing pressure.
annual	Annual pasture plants complete their life cycle from germination to death in one year. While annual plants are often a good source of nutrition they do not survive in times of low rainfall and are less reliable in the maintenance of ecosystem processes.
forb	A herbaceous, non-woody plant (often annual), but not a grass, sedge or rush.
shrub	A woody plant of relatively low height (generally < 2 m), having several stems arising from the base and lacking a single trunk.

Plant Names

Vegetation mentioned in the Photo Standards Guide section of this guide are listed below. Perennial pasture grasses are highlighted in green and accompanied by a forage value code. See the explanation box for a description of the code.

Pasture plant and weed names		
African love grass	Eragrostis curvula	grass
Aristida or wiregrass	Aristida spp.	grass
Arundinella reed grass	Arundinella nepalensis	grass
Balloon cotton	Gomphocarpus physocarpus	forb
Barbed wiregrass	Cymbopogon refractus	grass
Biloela buffel	Cenchrus ciliaris cv. Biloela	grass
Bisset creeping blue	Bothriochloa insculpta cv Bisset	grass
Black speargrass	Heteropogon contortus	grass
Bottlewasher grass	Enneapogon polyphyllus	grass
Brigalow grass	Paspalidium caespitosum	grass
Buffel	Cenchrus ciliaris	grass
Burnett blue	Bothriochloa bladhii	grass
Callide rhodes	Chloris gayana cv. Callide	grass
Cobbler peg	Bidens pilosa	forb
Cockatoo grass	Alloteropsis semialata	grass
Common fringe-rush	Fimbristylis dichotoma	rush
Couch	Elymus repens	grass
Creeping lantana	Lantana montevidensis	forb
Creeping oxalis	Oxalis corniculata	forb
Crotalaria spp.	Crotalaria spp.	forb
Early spring grass	Eriochloa pseudoacrotricha	grass
Fairygrass	Sporobolus caroli	grass
Feathertop rhodes	Chloris virgata	grass
Five minute grass	Tripogonella loliiformis	grass
Flannel weed	Solanum mauritianum	forb
Forest bluegrass	Bothriochloa bladhii ssp glabra	grass
Gayndah buffel	Cenchrus ciliaris	grass
Golden beard grass	Chrysopogon fallax	grass
Green panic	Megathyrsus maximus	grass
Indian couch	Bothriochloa pertusa	grass
Kangaroo grass	Themeda triandra	grass
Katambora rhodes	Chloris gayana	grass
Khaki burr	Alternanthera pungens	forb
Love grass	Eragrostis (purple and woodland lovegrass)	grass
Maynes pest	Glandularia aristigera	forb

Plant Names

Pasture plant and weed names		
Mulga fern	Cheilanthes sieberi	fern
Native glycine	Glycine spp	legume
Native panic	Panicum effusum	grass
Native rats tail grass	Sporobolus spp.	grass
Native sensitive plant	Neptunia gracilis	forb
Paramatta grass	Sporobolus africanus	grass
Parthenium	Parthenium hysterophorus	forb
Paspalum	Paspalum dilatatum	grass
Pigweed	Amaranthus blitoides	forb
Pitted bluegrass	Bothriochloa decipiens	grass
Prickly pear	Opuntica stricta	shrub
Queensland blue	Dichanthium sericeum	grass
Rats tail	Weedy Sporobolus spp.	grass
Red natal	Melinis repens	grass
Rhynchosia	Rhynchosia minima	legume
Rubbervine	Cryptostegia grandiflora	shrub
Sabi grass	Urochloa mosambicensis	grass
Scented top	Capillipedium spicigerum	grass
Scotch thistle	Onopordum acanthium	forb
Seca stylo	Stylosanthes scabra	legume
Sedge	Cyperaceae spp.	sedge
Setaria	Setaria sphacelata	grass
Shot grass	Paspalidium globoideum	grass
Sida	Sida spp	forb
Silk sorghum	Sorghum spp. Hybrid cv Silk	grass
Silky brown top	Eulalia aurea	grass
Slender chloris	Chloris divaricata var. divaricata	grass
Spikey sida	Sida suspicata	forb
Spinifex	Triodia spp.	grass
Tree pear	Opuntia tomentosa	shrub
Urochloa	Urochloa mosambicensis	grass
Euphorbia species	Euphorbia spp.	forb
White speargrass	Aristida spp.	grass
Woody false sandalwood	Eremophila mitchellii	shrub
Wynn cassia	Chamaecrista rotundifolia	legume

Table Legend:

Preferred

Intermediate

Non Preferred

Weed

Unpalatable

Land Types Of The Burnett River Catchment Area

Information about the region's land types has been included along with the land condition photo standards for each land type.

A land type is an area of grazing land that has characteristic patterns of soil, vegetation and landform that are easily recognised by graziers and landholders in a region. Land type descriptions are based on extensive literature review and correlation with previous published land type descriptions and regional ecosystems. Land types are described in terms of their landform; woody vegetation; pasture composition; suitable sown pastures; introduced weeds; soil characteristics; land use and management recommendations; land use limitations; conservation features and related management; and regional ecosystems.

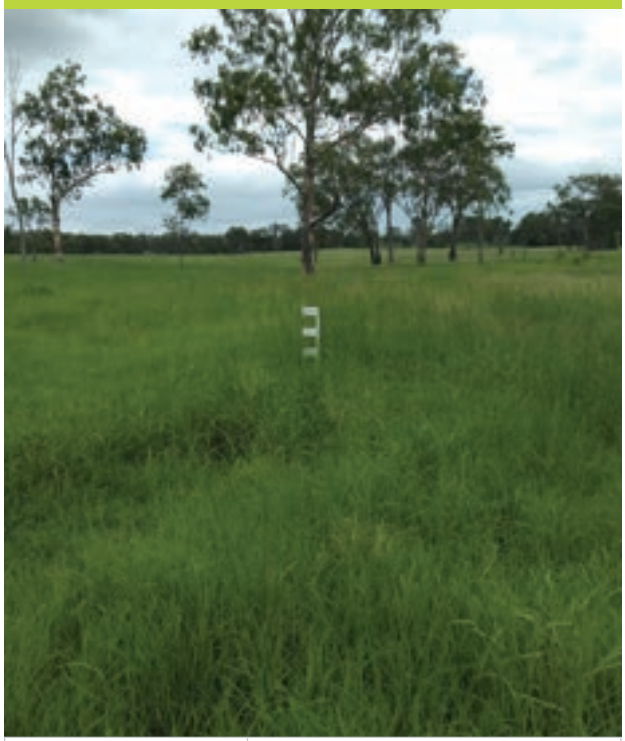
There is a degree of diversity within land types and because of this, not all characteristics can be captured in a single photo standard.

Blue Gum On Clay A & B

A

Plant Species:	Forest Bluegrass, Rhynchosia, Native Sensitive Plant, Black Speargrass
Weeds:	-
Weed Abundance:	None
Pasture Density	Very High (Touching)
Pasture TSDM (kg/ha)	6500
Proportion	98%
Pasture Condition	Good
Ground Cover	Very High
Soil Condition	Stable
Land Condition	A
Wood Vegetation	Blue Gum
Comments	-

B



Plant Species:	Forest Bluegrass, Indian Couch, Native Panic, Black Speargrass, Rhynchosia
Weeds:	Balloon Cotton, Crotalaria Spp.
Weed Abundance:	Slight
Pasture Density	Very High (Touching)
Pasture TSDM (kg/ha)	4750
Proportion	70%
Pasture Condition	Fair
Ground Cover	Very High
Soil Condition	Stable
Land Condition	B
Wood Vegetation	Blue Gum, Moreton Bay Ash
Comments	Good pasture density however presence of Indian couch

Blue Gum On Clay C & D

C

Plant Species:	Aristida, Native Panic, Forest Bluegrass, Abutilon Spp.
Weeds:	Creeping Lantana, Spiky Sida
Weed Abundance:	Slight
Pasture Density	High (Slightly Separated)
Pasture TSDM (kg/ha)	4500
Proportion	25%
Pasture Condition	Poor
Ground Cover	Very High
Soil Condition	Stable
Land Condition	C
Wood Vegetation	Blue Gum
Comments	High yield in picture area

D

Plant Species:	Green Panic
Weeds:	Parthenium
Weed Abundance:	Abundant
Pasture Density	High (Slightly Separated)
Pasture TSDM (kg/ha)	2800
Proportion	60%
Pasture Condition	Very Poor
Ground Cover	Very High
Soil Condition	Stable
Land Condition	D
Wood Vegetation	River Red Gum, Sally Wattle
Comments	-

Blue Gum On Clay

Landform	Broad, low sloping floodplains on valley floors.
Woody vegetation	Tall open forest of Queensland blue gum and Moreton Bay ash with occasional broad-tleaved apple, silver-leaved ironbark, rough-barked apple and broad-leaved ironbark. Understorey usually absent.
Expected pasture composition	Southern black speargrass pastures. * Denotes non-native "Expected Pasture Composition" species.
Preferred	Black speargrass, forest bluegrass, Queensland bluegrass, scentedtop, hairy panic.
Intermediate	Spring grass, liverseed (urochloa) grass, bamboo speargrass, umbrella grass.
Non-preferred	Wiregrasses (e.g. dark), slender chloris.
Legumes	Woolly glycine, rhynchosia, glycine pea, creeping tick trefoil.
Annual grasses	Small burr grass.
Suitable sown pastures	Creeping bluegrass, Rhodes grass, Angleton grass, leucaena, butterfly pea, Caatinga stylo, Desmanthus.
Introduced weeds	Chinese elm, broad-leaved pepper tree, cat's claw creeper.
Soil	Deep (>150 cm) dark cracking clays (black earths, vertosols), brown sandy loams (earthy sands, tenosols) and sandy clay loams (prairie, dermosols).
Description	Surface: Friable, sandy; weakly self-mulching, or hard-setting; Surface texture: sandy clay loam to medium clay; Subsoil texture: sandy loam to light medium clay to medium heavy clay.
Features	Some calcium carbonate and iron/manganese nodules and segregations may be present in prairie and black earths subsoils. Surface crust forms after rain on prairie soils.
Water availability	Low (earthy sands) to moderate (prairie) to high (black earths) PAWC.
Drainage	Rapidly (earthy sands), well (prairie) and moderately (black earths) drained.
Rooting depth	Effective rooting depth >100 cm (earthy sands, prairie, black earths).
Fertility	Moderate; low nitrogen; variable (earthy sands), high (prairie), very high (black earths) phosphorus; variable (earthy sands), moderate to high potassium.

Land Type

<table>
<tr><td>Salinity</td><td>Non-saline (earthy sands) or very low (prairie) to low (black earths) surface salinity; moderate below 80–100 cm (black earths).</td></tr>
<tr><td>Sodicity</td><td>Non-sodic at the surface; slightly sodic or sodic below 80 cm (black earths) to strongly sodic subsoils (prairie).</td></tr>
<tr><td>pH</td><td>Slightly acidic (pH 6.0) at surface; increasing to very slightly (prairie) or moderately alkaline (black earths) at depth. Neutral to alkaline throughout (earthy sands).</td></tr>
<tr><td>Long-term carrying capacity information (A condition)</td><td>
Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day
Median annual rainfall 663 – 754 mm
<table>
<tr><th>Pasture type</th><th>Median tree cover (TBA m2/ha) (FPC %)</th><th>Median annual pasture growth (DM kg/ha)</th><th>Safe annual utilisation pasture growth (%)</th><th>LTCC (ha/AE)</th></tr>
<tr><td>Native species</td><td>0 TBA/FPC</td><td>4480 - 4680</td><td>30%</td><td>2.1 – 2.2</td></tr>
<tr><td></td><td>11 TBA
27 FPC</td><td>2350 - 3060</td><td>30%</td><td>3.2 – 4.1</td></tr>
</table>
</td></tr>
<tr><td>Enterprise</td><td>Fattening</td></tr>
<tr><td>Land use management and recommendations</td><td>
- Suitable for grazing of native and improved pastures and cropping (not if soil <45 cm).
- Use of minimum tillage and maintenance of effective ground cover (>50%) and conservative stocking practices (spelling pastures, flexible stocking rates) are important to retain organic matter, maintain soil structure, reduce runoff and minimise risk of erosion.
- Retain timber on ridges, in drainage lines and at changes of slope at base of hills to lower watertable and control salinity. Use electric fences rather than fixed fences on flood prone areas.
- Burning is recommended every 3–4 years to control regrowth (ironbarks, wattles) and to enhance preferred pasture species.
</td></tr>
<tr><td>Land use limitations</td><td>
- Prone to flooding, streambank erosion and waterlogging. Moderate to high erosion hazard.
- Low moisture availability on rapidly drained soils; poor internal drainage on lower slopes of black earth soils; and hard-setting, surface sealing clays.
</td></tr>
<tr><td>Conservation features and related management</td><td>
- While blue gum is common, few extensive, intact remnants remain. The large hollows often found in large, old blue gums are important nesting sites and habitat for birds and marsupials.
- Many of the freshwater wetlands in the inland Burnett are associated with this land type.
- Blue gum regenerates readily in the absence of grazing and regular fire.
- Regrowth can be encouraged by allowing remnants to expand and establish connection with other areas of remnant vegetation.
- Regrowth has hardwood potential.
</td></tr>
<tr><td>Regional Ecosystems</td><td>11.3.4, 11.3.27a-c.</td></tr>
<tr><td>Land resource area</td><td>Floodplains.</td></tr>
</table>

Blue Gum On Granite A & B

A

Plant Species:	Black Spear Grass, Secca Stylo, Goldern Beard, Green Panic, Red Natal
Weeds:	None
Weed Abundance:	None
Pasture Density	High (Slightly Separated)
Pasture TSDM (kg/ha)	3500
Proportion	95%
Pasture Condition	Good
Ground Cover	Very High
Soil Condition	Stable
Land Condition	A
Wood Vegetation	Blue Gum
Comments	Roadside ungrazed

B

Plant Species:	Black Spear Grass, White Speargras, Red Natal, Golden Beard Grass, Love Grass
Weeds:	Prickly Pear
Weed Abundance:	Slight
Pasture Density	High (Slightly Separated)
Pasture TSDM (kg/ha)	2000
Proportion	-
Pasture Condition	Fair
Ground Cover	High
Soil Condition	Slight Disturbance
Land Condition	B
Wood Vegetation	Blue Gum, Narrow-Leaved Ironbarck
Comments	Roadside ungrazed

Blue Gum On Granite C & D

C

Plant Species:	Red Natal, Black Spear Grass, Love Grass, White Spear, Goldern Beard
Weeds:	Sida
Weed Abundance:	Slight
Pasture Density	Moderate (Clearly Separated)
Pasture TSDM (kg/ha)	1200
Proportion	50%
Pasture Condition	Poor
Ground Cover	Moderate
Soil Condition	Moderate Disturbance
Land Condition	C
Wood Vegetation	Blue Gum
Comments	Continuous graze

D

Plant Species:	Wynn Cassia, Black Spear Grass, White Spear Grass, Red Natal, Golden Beard, Secca
Weeds:	None
Weed Abundance:	None
Pasture Density	Very Low (Isolated)
Pasture TSDM (kg/ha)	300
Proportion	30%
Pasture Condition	Very Poor
Ground Cover	Very Low
Soil Condition	Moderate Disturbance
Land Condition	D
Wood Vegetation	Blue Gum
Comments	Monoculture

Blue Gum On Granite

Landform	Undulating rises to rolling hills.
Woody vegetation	Open forest to woodland of Queensland blue gum, silver-leaved ironbark and narrowleaved ironbark. Understorey of wattle and minor beefwood.
Expected pasture composition	Southern black speargrass pastures. * Denotes non-native "Expected Pasture Composition" species.
Preferred	Black speargrass, red Natal grass*, silky umbrella grass, native millet.
Intermediate	Pitted bluegrass grass, bottlewasher grasses, slender chloris, barbwire grass.
Non-preferred	Golden beard grass, comet grass.
Legumes	Emu foot, glycine pea.
Annual grasses	Small burr grass.
Suitable sown pastures	Creeping bluegrass, fine stem stylo, shrubby stylo, Wynn cassia.
Introduced weeds	Blue heliotrope.
Soil	Shallow to moderately deep texture contrast soils.
Description	Surface: Hard-setting; Surface texture: loamy sand to sandy clay loam; Subsoil texture: sandy clay to medium clay.
Features	Stone free. Bleached subsurface layer, mottled subsoils.
Water availability	Low (yellow) to high (red) PAWC.
Drainage	Poorly drained (yellow) to moderately drained (red).
Rooting depth	Effective rooting depth 20 cm (yellow) to 60 cm (red).
Fertility	Low; low to moderate nitrogen, very low phosphorus, low to moderate to high potassium.

Land Type

<table>
<tr><td>Salinity</td><td>Low to non-saline.</td></tr>
<tr><td>Sodicity</td><td>Non-sodic (red), strongly sodic below 50 cm (yellow).</td></tr>
<tr><td>pH</td><td>Alkaline soil reaction trend, slightly acidic at surface, increasing alkalinity (pH 6.0–7.5) upper subsoils and moderately alkaline (7.8–8.6) in lower subsoils.</td></tr>
<tr><td>Long-term carrying capacity information (A condition)</td><td>
<table>
<tr><td colspan="5">Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day</td></tr>
<tr><td colspan="5">Median annual rainfall 694 – 785 mm</td></tr>
<tr><td>Pasture type</td><td>Median tree cover (TBA m2/ha) (FPC %)</td><td>Median annual pasture growth (DM kg/ha)</td><td>Safe annual utilisation pasture growth (%)</td><td>LTCC (ha/AE)</td></tr>
<tr><td>Native species</td><td>0 TBA/FPC</td><td>4760 - 5010</td><td>30%</td><td>2.1 – 2.2</td></tr>
<tr><td></td><td>12 TBA
30 FPC</td><td>2040 - 2730</td><td>30%</td><td>3.6 – 4.8</td></tr>
</table>
</td></tr>
<tr><td>Enterprise</td><td>Breeding and stores.</td></tr>
<tr><td>Land use management and recommendations</td><td>- Suitable for grazing of native and improved pastures, short-term cropping only on red soils.
- Maintenance of effective ground cover (>50%) and conservative stocking practices (spelling pastures, flexible stocking rates) are important to retain organic matter, maintain soil structure, reduce runoff and minimise risk of erosion.
- Retain timber on stony ridges and at changes of slope at base of hills to control erosion (particularly tunnel erosion).
- Burning is recommended every 2–3 years to control regrowth (blue gum, ironbarks, wattles) and to enhance preferred pasture species.</td></tr>
<tr><td>Land use limitations</td><td>- Shallow effective rooting depth and poor internal drainage (yellow).
- Low fertility.
- Low PAWC will restrict dryland crop growth.
- Hard-setting surface affects infiltration and cultivation.
- Small seeded crops and pasture difficult to establish due to rapid drying and sealing of sandy surface.
- Moderate erosion hazard on low to moderate slopes (red).
- Very high erosion hazard and particularly prone to tunnel erosion (yellow).</td></tr>
<tr><td>Conservation features and related management</td><td>- Extensively cleared for native pasture in some areas; relatively intact in others.
- These are generally grassy woodlands that provide habitat for larger marsupials.
- Hollow-bearing habitat trees are important nesting sites for birds and arboreal mammals.
- Landscape health can be enhanced through appropriate fire regimes, grazing management and allowing regrowth to develop into effective wildlife corridors.</td></tr>
<tr><td>Regional Ecosystems</td><td>12.12.23, 12.12.12.</td></tr>
<tr><td>Land resource area</td><td>Granite Hills.</td></tr>
</table>

Box On Clay A & B

A

Plant Species:	Urochloa, Buffel, Green Panic, Couch
Weeds:	Sida, Khaki Burr
Weed Abundance:	Slight
Pasture Density	Very High (Touching)
Pasture TSDM (kg/ha)	3500
Proportion	95%
Pasture Condition	Good
Ground Cover	Very High
Soil Condition	Stable
Land Condition	A
Wood Vegetation	Poplar Box
Comments	Ungrazed laneway

B

Plant Species:	Buffel, Urochloa, Pitted Bluegrass, Chloris, Love Grass
Weeds:	Sida
Weed Abundance:	Slight
Pasture Density	High (Slightly Separated)
Pasture TSDM (kg/ha)	2000
Proportion	70%
Pasture Condition	Fair
Ground Cover	Moderate
Soil Condition	Stable
Land Condition	B
Wood Vegetation	Poplar Box
Comments	Laneway

Box On Clay C & D

C

Plant Species:	Pitted Bluegrass, Black Speargrass, Urochloa, Secca, Shot Grass
Weeds:	Prickly Pear
Weed Abundance:	Slight
Pasture Density	High (Slightly Separated)
Pasture TSDM (kg/ha)	1200
Proportion	50%
Pasture Condition	Poor
Ground Cover	High
Soil Condition	Stable
Land Condition	C
Wood Vegetation	Poplar Box
Comments	Grazed road side

D

Plant Species:	Buffel, Couch, Urochla, Shot Grass
Weeds:	-
Weed Abundance:	-
Pasture Density	Low (Well Separated)
Pasture TSDM (kg/ha)	300
Proportion	-
Pasture Condition	Very Poor
Ground Cover	Very Low
Soil Condition	Moderate Disturbance
Land Condition	D
Wood Vegetation	Poplar Box
Comments	Laneway

Box On Clay

Landform	Backplains and levee backslopes of alluvial plains and creek flats.
Woody vegetation	Tall open woodland to open forest of poplar box, gum-topped box, broad-leaved apple. Understorey often absent.
Expected pasture composition	Southern black speargrass pastures. * Denotes non-native "Expected Pasture Composition" species.
Preferred	Black speargrass, forest bluegrass, Queensland bluegrass, scentedtop, paspalum*.
Intermediate	Pitted bluegrass, barbwire grass.
Non-preferred	Wiregrasses (e.g. dark).
Legumes	Woolly glycine, rhynchosia, glycine pea.
Annual grasses	Small burr grass.
Suitable sown pastures	Creeping bluegrass, Rhodes grass, Angleton grass, Bambatsi panic, leucaena, butterfly pea, Caatinga stylo, Desmanthus.
Introduced weeds	-
Soil	Deep (>150 cm) dark grey or brown cracking clays (black earths).
Description	Surface: Self-mulching; Surface texture: medium clay; Subsoil texture: medium heavy clay.
Features	Some small quantities of calcium carbonate and iron/manganese nodules and segregations.
Water availability	High PAWC.
Drainage	Moderate
Rooting depth	Effective rooting depth >100 cm.
Fertility	Low to moderate; low nitrogen; variable phosphorus; moderate potassium.

Land Type

Salinity	Low below 80 cm.
Sodicity	Slightly sodic below 80 cm.
pH	Slightly acidic to neutral at surface; increasing to moderately alkaline at depth.
Long-term carrying capacity information (A condition)	Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day Median annual rainfall 631 – 707 mm

Pasture type	Median tree cover (TBA m2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	3990 - 4190	30%	2.3 – 2.4
	10 TBA 26 FPC	2700 - 2740	30%	3.6

Enterprise	Breeding and fattening.
Land use management and recommendations	– Suitable for grazing of native and improved pastures and cropping. – Use of minimum tillage and maintenance of effective ground cover (>50%) and conservative stocking practices (spelling pastures, flexible stocking rates) are important to retain organic matter, maintain soil structure, reduce runoff and minimise risk of erosion. – Retain timber in drainage lines and at changes of slope at base of hills to lower watertable and control salinity. – Avoid trafficking when wet to reduce soil compaction. – Burning is recommended every 2–3 years to control regrowth (poplar box, currant bush, false sandalwood) and to enhance preferred pasture species.
Land use limitations	– Subject to periodic flooding and waterlogging. – Imperfect internal drainage on low slopes and moderate erosion hazard. – Low fertility except for potassium.
Conservation features and related management	– Large poplar box trees often have hollows that are home to arboreal marsupials and provide nest sites for a wide range of birds such as owlet nightjars, owls and parrots. – Generally, the good grass cover provides shelter and food for ground dwelling animals such as wallabies and rufous bettongs.
Regional Ecosystems	12.3.10.
Land resource area	Floodplains.

Box On Erosive Soils A & B

A

Plant Species:	Green Panic, Secca Stylo, Rhodes Grass
Weeds:	None
Weed Abundance:	None
Pasture Density	Very High (Touching)
Pasture TSDM (kg/ha)	2500
Proportion	100%
Pasture Condition	Good
Ground Cover	Very High
Soil Condition	Stable
Land Condition	A
Wood Vegetation	Poplar Box
Comments	Ungrazed road side

B

Plant Species:	Green Panic, Black Speargrass, Secca Stylo, Rhodes Grass, Burnett Blue
Weeds:	None
Weed Abundance:	None
Pasture Density	Moderate (Clearly Separated)
Pasture TSDM (kg/ha)	1000
Proportion	90%
Pasture Condition	Fair
Ground Cover	Moderate
Soil Condition	Slight Disturbance
Land Condition	B
Wood Vegetation	Poplar Box
Comments	Not recently grazed

Box On Erosive Soils C & D

C

Plant Species:	Green Panic, Feathertop Rhodes, Burnett Blue, White Speargrass, Secca Stylo
Weeds:	Creeping Lantana
Weed Abundance:	Moderate
Pasture Density	Moderate (Clearly Separated)
Pasture TSDM (kg/ha)	700
Proportion	50%
Pasture Condition	Poor
Ground Cover	Very High
Soil Condition	Stable
Land Condition	C
Wood Vegetation	Poplar Box
Comments	Ungrazed with severe weed infestation

D

Plant Species:	Pitted Bluegrass, White Speargrass, Gayndah Buffel, Burnett Blue
Weeds:	Prickly Pear, Tree Pear, Creeping Lantana
Weed Abundance:	Moderate
Pasture Density	Very Low (Isolated)
Pasture TSDM (kg/ha)	200
Proportion	-
Pasture Condition	Poor
Ground Cover	Very Low
Soil Condition	Moderate Disturbance
Land Condition	D
Wood Vegetation	Poplar Box
Comments	Grazed. Probably cattle camp

Box On Erosive Soils

Landform	Broad low sloping, higher lying relict alluvial plains.
Woody vegetation	Open forest or woodland of poplar box, narrow-leaved ironbark, gum-topped box and occasionally rusty gum. Understorey usually absent, occasionally wilga and wattles.
Expected pasture composition	Wiregrass – pitted bluegrass pastures. * Denotes non-native "Expected Pasture Composition" species.
Preferred	Black speargrass, forest bluegrass, Queensland bluegrass, scentedtop.
Intermediate	Spider grass, bottlewasher grasses, silky umbrella grass.
Non-preferred	Wiregrasses (e.g. dark), slender chloris.
Legumes	Woolly glycine, rhynchosia, emu foot, creeping tick trefoil.
Annual grasses	Small burr grass.
Suitable sown pastures	Creeping bluegrass, Rhodes grass, shrubby stylo.
Introduced weeds	-
Soil	Yellow sandy texture contrast soils.
Description	Surface: Hard-setting; Surface texture: sandy loam to loamy sand; Subsoil texture: sandy clay to medium clay.
Features	Erosive, saline and sodic soils. Bleached A2 horizon. Some quartz gravel in surface.
Water availability	Low PAWC.
Drainage	Poorly drained.
Rooting depth	Effective rooting depth 20 cm.
Fertility	Low; low nitrogen, very low phosphorus, moderate to high potassium.
Salinity	Moderate to high salinity below 20 cm.

Land Type

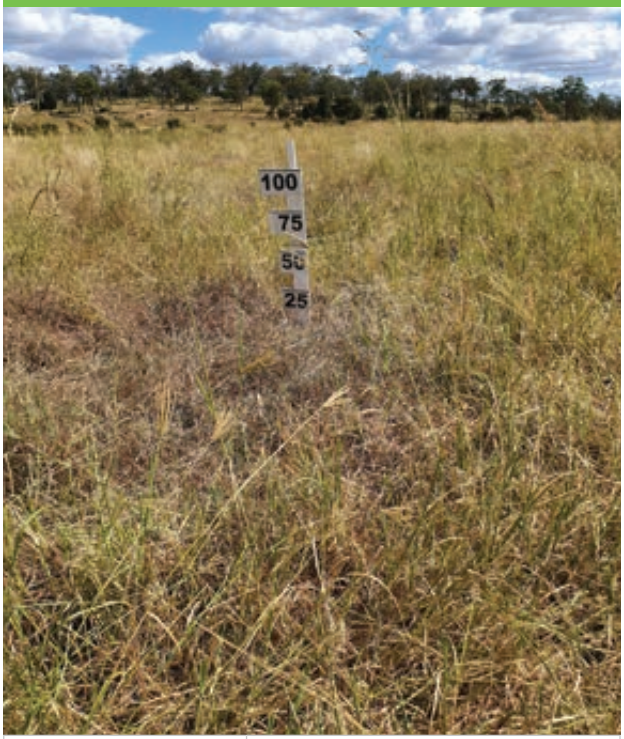
Sodicity	Strongly sodic subsoils.
pH	Alkaline (pH 8.0) to neutral soil reaction trend.
Long-term carrying capacity information (A condition)	Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day Median annual rainfall 631 – 676 mm

Pasture type	Median tree cover (TBA m2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	2860 - 2980	25%	3.9 – 4.1
	10 TBA 24 FPC	1410 - 1420	25%	8.2 – 8.3

Enterprise	Breeding and stores.
Land use management and recommendations	– Suitable for grazing of native and improved pastures. – Maintenance of effective ground cover (>70%) and conservative stocking practices (spelling pastures, flexible stocking rates) are important to retain organic matter, maintain soil structure, reduce runoff and minimise risk of erosion. – Retain timber in drainage lines and at changes of slope at base of hills to lower watertable and control salinity. – Burning is recommended every 4–6 years to control regrowth (box, false sandalwood, currant bush) and to enhance preferred pasture species.
Land use limitations	– Land subject to flooding and periodic waterlogging. – Low PAWC will restrict dryland crop growth. When cultivated surface sealing develops after rain, affecting crop establishment. – Narrow moisture range for successful cultivation. – Low fertility (except for potassium). – Root development affected by impermeable and saline subsoils. – High to extreme erosion hazard and prone to scalding.
Conservation features and related management	– Generally the good grass cover provides shelter and food for ground dwelling animals such as spectacled hare-wallabies and rufous bettongs. – Large poplar box trees often have hollows that are home to arboreal marsupials and provide nest sites for a wide range of birds such as owlet nightjars, owls and parrots. – Patch burning of these woodlands in the late winter months is preferable. Where grazed paddock areas need to be burnt to prevent excessive grazing pressure on new growth, with some burning prior to summer rains. – Mature trees can easily be burnt through at the base and therefore frequent burning can lead to loss of these important habitat trees. – Trees are important in the cycling of nutrients from deeper in the soil profile. – Due to the potential erosion hazard of these duplex soils good ground cover should be retained on slopes and drainage lines.
Regional Ecosystems	11.5.13, 11.9.7, 11.11.9.
Land resource area	Terraces.

Brigalow And Brigalow Belah A & B

A



Plant Species:	Callide Rhodes, Bisset Creeping Blue, Queensland Blue, Buffel, Silk Sorghum, Black Speargrass
Weeds:	Flannel Weed, Sida, Balloon Cotton
Weed Abundance:	Slight
Pasture Density	Very High (Touching)
Pasture TSDM (kg/ha)	2200
Proportion	99%
Pasture Condition	Good
Ground Cover	Very High
Soil Condition	Stable
Land Condition	A
Wood Vegetation	Brigalow
Comments	-

B

Plant Species:	Callide Rhodes, Katambora Rhodes, Silk Sorghum, Bissett Creeping Blue, Buffel
Weeds:	Prickly Pear, Sida, Flannel Weed, Balloon Cotton, Scotch Thistle, Cobbler Peg
Weed Abundance:	Slight
Pasture Density	High (Slightly Separated)
Pasture TSDM (kg/ha)	1800
Proportion	80%
Pasture Condition	Good
Ground Cover	Very High
Soil Condition	Stable
Land Condition	B
Wood Vegetation	Brigalow
Comments	-

Brigalow And Brigalow Belah C & D

C

Plant Species:	Early Spring Grass, Buffel, Silk Sorghum, Love Grass
Weeds:	Flannel Weed, Farmers Flea, Pig Weed, Cobbler Peg, Prickly Pear
Weed Abundance:	Moderate
Pasture Density	Moderate (Clearly Separated)
Pasture TSDM (kg/ha)	800
Proportion	50%
Pasture Condition	Poor
Ground Cover	Moderate
Soil Condition	Slight Disturbance
Land Condition	C
Wood Vegetation	Brigalow
Comments	Brigalow melon hole bladeplough regrowth

D

Plant Species:	Wire Grass Aristida, Love Grass, Buffel
Weeds:	Prickly Pear
Weed Abundance:	Slight
Pasture Density	Very Low (Isolated)
Pasture TSDM (kg/ha)	100
Proportion	10%
Pasture Condition	Very Poor
Ground Cover	Very Low
Soil Condition	Slight Disturbance
Land Condition	D
Wood Vegetation	Brigalow
Comments	Brigalow melon hole regrowth

Brigalow And Brigalow Belah

Landform	Gently undulating relict alluvial plains and higher lying level plains, and most slope positions on undulating low rises (slopes 1% to 4%).
Woody vegetation	Brigalow and brigalow belah open forest in association with wattles, wilga and softwood scrub.
Expected pasture composition	Brigalow pastures. * Denotes non-native "Expected Pasture Composition" species.
Preferred	Brigalow grass, Queensland bluegrass, hooky grass, leafy panic.
Intermediate	Slender chloris, slender rat's tail grass.
Non-preferred	Dark wiregrass, purple lovegrass.
Legumes	Woolly glycine, glycine pea.
Suitable sown pastures	Green panic, Gatton panic, creeping bluegrass, Angleton grass, Rhodes grass, buffel grass, Caatinga stylo, butterfly pea, siratro, leucaena, Desmanthus.
Introduced weeds	-
Soil	Brown and grey clays generally deep (>100–150 cm).
Description	Surface: Hard-setting to self-mulching; Surface texture: light medium to medium clay; Subsoil texture: medium to heavy clay.
Features	Weak gilgai may occur. Some quartz gravel but mostly stone free.
Water availability	Moderate PAWC (brown clays) to high PAWC (grey clays).
Drainage	Imperfect (grey clays) to moderately drained (brown clays).
Rooting depth	Effective rooting depth 60 cm (grey clays), >100 cm (brown clays).
Fertility	Moderate to high; low to high nitrogen, low phosphorus, high to very high potassium.
Salinity	Very low throughout profile (brown clays); moderate to high below 50 cm (grey clays).

Land Type

Sodicity	Sodic (below 60 cm brown clays) to strongly sodic (below 20 cm grey clays).
pH	Alkaline at surface (pH 7.5–8.0); strongly alkaline below 60 cm (9.0–9.5).
Long-term carrying capacity information (A condition)	Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day Median annual rainfall 629 – 726 mm

Pasture type	Median tree cover (TBA m2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	5380 - 6110	30%	1.6 – 2.1
	13 TBA 32 FPC	3170 - 3770	30%	2.6 – 3.1

Enterprise	Breeding herds, fattening.
Land use management and recommendations	– Suitable for mixed farming cropping (forage and grain). – Suitable for grazing of native and improved pastures (grey clays) and for most field and forage crops (brown clays). – Use of runoff control structures (contour banks, waterways); use minimum tillage and maintenance of effective ground cover (>50%) and conservative stocking practices (spelling pastures, flexible stocking rates) are important to retain organic matter, maintain soil structure, reduce runoff and minimise risk of sheet, rill and wind erosion. – Control regrowth if limiting pasture growth by burning every 3–5 years. – Retain timber in ridges and at changes of slope at base of hills to lower the watertable and control salinity.
Land use limitations	– Shallow effective rooting depth due to impermeable and saline subsoils. – Hard-setting surfaces affect workability. – Sodic subsoils impede internal drainage and restrict crop root development. – Minor occurrences of salinity in drainage lines. Narrow moisture range for successful cultivation. – Moderate to high risk of erosion; high risk of gully erosion where water is concentrated. – Control regrowth if limiting pasture growth by burning >6 years.
Conservation features and related management	– Extensively cleared for pasture and cropping. – Only very small areas remain and these are used by migratory birds such as yellow robins, grey fantails, varied trillers and rufous fantails. – These scrubs are important habitat for bush turkeys and black-striped wallabies. – Remnants are threatened by weed invasion and fire on their margins. – The use of fire breaks and cool season burns reduce this risk. – The ideal scenario for conservation would be to fence these unique areas off from grazing.
Regional Ecosystems	12.8.23, 12.12.26, 12.12.26a.
Land resource area	Undulating Plains; Relict Alluvial Plains.

Cypress Pine Country A & B

A

Plant Species:	Pitted Bluegrass, Golden Beard Grass, Red Natal Grass, Buffel,
Weeds:	Maynes Pest, Mulga Fern, Sida, Creeping Oxalis, Dark Wiregrass
Weed Abundance:	None
Pasture Density	Very High (Touching)
Pasture TSDM (kg/ha)	2750
Proportion	80%
Pasture Condition	Good
Ground Cover	High
Soil Condition	Stable
Land Condition	A
Wood Vegetation	Wilga, Narrow-Leaved Ironbark, Poplar Box
Comments	Good condition for type of country. Country generally spelled 9 months of the year. Good seedlings.

B

Plant Species:	Aristida Ramosa Pitted Bluegrass, Button Grass,
Weeds:	Maynes Pest, Sida, Sock Burr, Darling Pea.
Weed Abundance:	None
Pasture Density	Moderate (Clearly Separated)
Pasture TSDM (kg/ha)	750
Proportion	70%
Pasture Condition	Fair
Ground Cover	Moderate
Soil Condition	Slight Disturbance
Land Condition	B
Wood Vegetation	Cypress Pine, Silver-Leaved Ironbark
Comments	Cattle activity when wet caused erosion. Large variety juvenile plants after recent rain.

Cypress Pine Country C & D

C

Plant Species:	Red Natal, Dark Wiregrass, Black Spear Grass, Golden Beard Grass, Five Minute Grass, Common Fringe-Rush, Mulga Fern, Pitted Blue Grass, Buffel
Weeds:	African Lovegrass
Weed Abundance:	Slight
Pasture Density	High (Slightly Separated)
Pasture TSDM (kg/ha)	1500
Proportion	50%
Pasture Condition	Poor
Ground Cover	High
Soil Condition	Slight Disturbance
Land Condition	C
Wood Vegetation	Cypress, Wattle, Poplar Box
Comments	-

D

Plant Species:	Wiregrass
Weeds:	-
Weed Abundance:	None
Pasture Density	Very Low (Isolated)
Pasture TSDM (kg/ha)	300
Proportion	0%
Pasture Condition	Very Poor
Ground Cover	Very Low
Soil Condition	Moderate Disturbance
Land Condition	D
Wood Vegetation	Cypress, Acacia
Comments	-

Cypress Pine Country

Landform	Undulating to low hills.
Woody vegetation	Cypress pine scrub with occasional silver-leaved ironbark, narrow-leaved ironbark, smooth-barked apple gum and Clarkson's bloodwood. An understorey of myrtle, dysentery bush and wattles.
Expected pasture composition	* Denotes non-native "Expected Pasture Composition" species.
Preferred	Black speargrass, cotton panic, hairy panic.
Intermediate	Golden beard grass, pitted bluegrass, tall chloris, barbwire grass.
Non-preferred	Wiregrass (e.g. many-headed, Jericho), bottlewasher grasses, summer grass, poverty grass, lovegrasses.
Annual grasses	Button grass, small burr grass, comet grass.
Common forbs	Pimelea (non-preferred).
Suitable sown pastures	Not suitable for development.
Introduced weeds	-
Soil	Coarse sand (tenosol).
Description	Surface: Firm to hard-setting with rock outcrops; Surface texture: sand to sandy loam; Subsoil texture: sand to sandy loam.
Water availability	Low to very low.
Drainage	Poorly drained (yellow) to moderately drained (red).
Rooting depth	Deep
Fertility	Low total nitrogen; low phosphorus.
Salinity	Low

Land Type

Sodicity	Non-sodic
pH	Neutral
Long-term carrying capacity information (A condition)	Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day Median annual rainfall 521 – 616 mm

Pasture type	Median tree cover (TBA m2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	1140 - 1440	20%	10 - 13
	13 TBA 32 FPC	360 - 480	20%	30 – 41

Enterprise	Breeding
Land use management and recommendations	– The commercial timber species are useful for construction purposes.
Land use limitations	– Low fertility. – Not suited to clearing or cultivation. – Low soil moisture storage.
Conservation features and related management	– Extensive areas of cypress pine forests occur on state forest and timber reserves and are uniquely known for their high number of endangered, vulnerable and rare species including death adders, golden-tailed geckoes and yellow-tufted honeyeaters. – Where there is an understorey or a high density of saplings, cypress pine provides day time refuge areas for black-striped wallabies and nightjars, and habitat for birds which feed on or near the ground (e.g. spotted quail thrush, various thornbills, squatter pigeons, bronze wing pigeons, and grey thrush). – Cypress pine forests are generally managed for low frequency, low intensity fire regimes which in turn promote a dense fine and coarse litter layer and often multiple vegetation heights. – These forests support a rich reptile fauna that use important litter and peeling bark of old senescent trees habitat. The multi layered forests also provide habitat for a range of woodland bird species including honeyeaters, hooded robins, yellow robins and grey-crowned babblers. – Sandy cypress ecosystems are important recharge areas for stream and groundwater. – This land type is very susceptible to fire damage and therefore a firebreak around its periphery is warranted, especially if adjoining a dense stand of buffel grass. – Conservation objectives should aim to manage fire in these areas, particularly for retention of fallen litter 'fuel' loads that are important for reptile species.
Regional Ecosystems	11.3.18, 11.3.19, 11.5.4, 11.5.5a, 11.10.11, 11.10.9, 11.8.9, 11.12.6b.
Land resource area	Land units (Gunn et al 1967) Playfair 3, Lennox 1 & 2; AMU (DPI 1993) Duckponds.

Gum-Topped Box A & B

A

Plant Species:	Cockatoo Grass, Golden Beard Grass, Canegrass, Sehima Nerve, Barbed Wiregrass
Weeds:	-
Weed Abundance:	None
Pasture Density	Very High (Touching)
Pasture TSDM (kg/ha)	4000
Proportion	80%
Pasture Condition	Good
Ground Cover	Very High
Soil Condition	Stable
Land Condition	A
Wood Vegetation	Gum Topped Box, Narrow-Leaved Ironbark, Wattles, Soap Bush
Comments	-

B

Plant Species:	Queensland Blue, Black Speargrass, Red Natal Grass, White Spear, Barbwire, Cockatoo, Panicum
Weeds:	None
Weed Abundance:	None
Pasture Density	High (Slightly Separated)
Pasture TSDM (kg/ha)	2000
Proportion	70%
Pasture Condition	Fair
Ground Cover	High
Soil Condition	Stable
Land Condition	B
Wood Vegetation	Gum Topped Box, Narrow-Leaved Ironbark, Wattle
Comments	Not grazed

Gum-Topped Box C & D

C

Plant Species:	Queensland Blue, White Speargrass, Golden Beard Grass, Barb Wiregrass
Weeds:	False Sandalwood
Weed Abundance:	Slight
Pasture Density	Moderate (Clearly Separated)
Pasture TSDM (kg/ha)	800
Proportion	50%
Pasture Condition	Poor
Ground Cover	Moderate
Soil Condition	Slight Disturbance
Land Condition	C
Wood Vegetation	Gum Topped Box
Comments	Not grazed

D

Plant Species:	Queensland Blue, White Speargrass, Sedge, Fairy Grass, Shot Grass
Weeds:	Prickly Pear, Wooing Weeds, False Sandalwood
Weed Abundance:	Slight
Pasture Density	Low (Well Separated)
Pasture TSDM (kg/ha)	100
Proportion	20%
Pasture Condition	Poor
Ground Cover	Moderate
Soil Condition	Moderate Disturbance
Land Condition	D
Wood Vegetation	Gum Topped Box
Comments	Not grazed

Gum-Topped Box

Landform	Slightly elevated level to gently undulating relict floodplains, backplains and slightly higher terraces of major streams.
Woody vegetation	Open forest to woodland of gum-topped box, narrow-leaved ironbark and poplar box, with scattered rusty gum and Queensland blue gum. Occasional understorey of wattles, myrtle tree and beefwood.
Expected pasture composition	Wiregrass – pitted bluegrass pastures. * Denotes non-native "Expected Pasture Composition" species.
Preferred	Black speargrass, forest bluegrass, barbwire grass, kangaroo grass, pitted bluegrass grass.
Intermediate	Spider grass (native couch), bottlewasher grasses, umbrella grass.
Non-preferred	Wiregrasses (e.g. dark), slender chloris.
Legumes	Woolly glycine, emu foot, creeping tick trefoil.
Annual grasses	Small burr grass.
Suitable sown pastures	None suitable.
Introduced weeds	-
Soil	Moderately deep (120 cm) yellow, grey or brown texture contrast soils (solodics).
Description	Surface: Hard-setting; Surface texture: sandy loam to clay loam; Subsoil texture: sandy clay to medium to heavy clay.
Features	Some surface quartz gravel, generally stone free. Small amounts of calcium carbonate and iron/manganese nodules in subsoils.
Water availability	Low to moderate PAWC.
Drainage	Poorly drained subsoils.
Rooting depth	Effective rooting depth 15–20 cm.
Fertility	Low; low nitrogen, very low to moderate phosphorus, low to high potassium.
Salinity	Moderate to high salinity below 20 cm.

Land Type

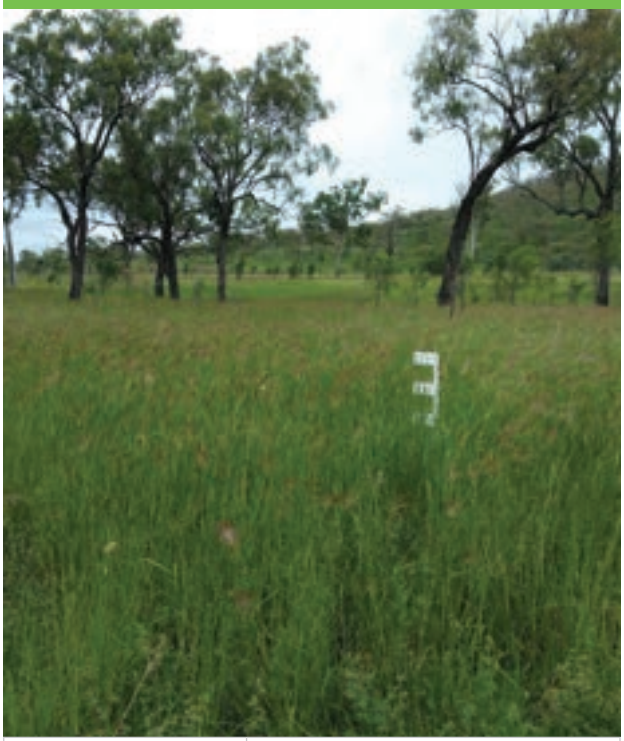
Sodicity	Sodic to strongly sodic subsoils.
pH	Acid (pH 6.5) to alkaline (pH 8.5–9.0) soil reaction trend (solodics).
Long-term carrying capacity information (A condition)	Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day Median annual rainfall 663 – 754 mm

Pasture type	Median tree cover (TBA m2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	3820 - 4500	25%	2.6 - 3.1
	10 TBA 25 FPC	1620 - 2820	25%	4.2 – 7.2

Enterprise	Breeding
Land use management and recommendations	– Suitable for grazing of native and improved pastures, short-term cropping only on red soils. – Maintenance of effective ground cover (>50%) and conservative stocking practices (spelling pastures, flexible stocking rates) are important to retain organic matter, maintain soil structure, reduce runoff and minimise risk of erosion. – Retain timber on stony ridges and at changes of slope at base of hills to control erosion (particularly tunnel erosion). – Burning is recommended every 2–3 years to control regrowth (blue gum, ironbarks, wattles) and to enhance preferred pasture species.
Land use limitations	– Subject to periodic flooding and waterlogging. – Shallow effective rooting depth often due to impermeable and saline subsoils. – Soil salinity and or sodicity may affect plant growth. – When cultivated, surface sealing occurs after rain affecting crop establishment. – Hard setting surface affects infiltration and cultivation. – High erosion hazard, particularly prone to scalding and gully erosion.
Conservation features and related management	– Remnant woodlands are important habitat for gliders, possums, koalas, tree creepers, speckled warblers, powerful owls and ground foraging birds. – These woodlands provide important corridors through the landscape for both resident and dispersing fauna. – Frequent fires reduce the shrubby understorey, but variable fire regimes encourage mosaics. – Heavy grazing reduces fuel loads and exposes the soil surface to erosion.
Regional Ecosystems	11.5.20, 11.9.13, 11.11.10a, 11.12.2b, 12.8.14a, 12.9–10.3.
Land resource area	Terraces and Relict Alluvial Plains.

Narrow-Leaved Ironbark And Bloodwood On Non-Cracking Clay A & B

A



Plant Species:	Forest Bluegrass, Seca Stylo, Indian Couch, Golden Beard Grass, Wiregrass
Weeds:	Spiked Sida
Weed Abundance:	Slight
Pasture Density	Very High (Touching)
Pasture TSDM (kg/ha)	6000
Proportion	95%
Pasture Condition	Good
Ground Cover	Very High
Soil Condition	Stable
Land Condition	A
Wood Vegetation	Narrow-Leaved Ironbark, Bloodwood, Corkwood Wattle
Comments	-

B

Plant Species:	Golden Beard Grass, Green Panic, Black Speargrass, Red Natal, Pitted Bluegrass
Weeds:	Spiked Sida
Weed Abundance:	Slight
Pasture Density	Moderate (Clearly Separated)
Pasture TSDM (kg/ha)	2500
Proportion	70%
Pasture Condition	Fair
Ground Cover	High
Soil Condition	Slight Disturbance
Land Condition	B
Wood Vegetation	Narrow-Leaved Ironbark, Bloodwood, Beefwood
Comments	-

Narrow-Leaved Ironbark And Bloodwood On Non-Cracking Clay C & D

C

Plant Species:	Aristida Ramosa, Indian Couch, Forest Bluegrass, Secca, Black Speargrass
Weeds:	Spiked Sida, Indian Couch
Weed Abundance:	Moderate
Pasture Density	Very High (Touching)
Pasture TSDM (kg/ha)	3500
Proportion	25%
Pasture Condition	Poor
Ground Cover	Very High
Soil Condition	Slight Disturbance
Land Condition	C
Wood Vegetation	Narrow-Leaved Ironbark, Beefwood, Bloodwood, Corkwood Wattle
Comments	-

D

Plant Species:	Pitted Bluegrass, Sabi Grass, Sida
Weeds:	-
Weed Abundance:	None
Pasture Density	Very Low
Pasture TSDM (kg/ha)	50
Proportion	Very Poor
Pasture Condition	Very Low
Ground Cover	Severe Disturbance
Soil Condition	D
Land Condition	Bloodwood
Wood Vegetation	-
Comments	-

Narrow-Leaved Ironbark And Bloodwood On Non-Cracking Clay

Landform	Undulating rises and mid to lower slopes of low hills and ranges.
Woody vegetation	Woodlands of silver-leaved and narrow-leaved ironbarks and variable-barked bloodwood with occasional Queensland blue gum and areas of softwood scrub. Understorey usually absent.
Expected pasture composition	Southern black speargrass pasture. * Denotes non-native "Expected Pasture Composition" species.
Preferred	Black speargrass, forest bluegrass, Queensland bluegrass, scentedtop, paspalum*.
Intermediate	Pitted bluegrass, Indian couch*, barbwire grass, silkyheads.
Non-preferred	Wiregrasses (dark, erect kerosene), slender chloris, woodland lovegrass.
Legumes	Woolly glycine, rhynchosia, emu foot, creeping tick trefoil.
Suitable sown pastures	Creeping bluegrass, Rhodes grass, Gatton panic, Caatinga stylo, Desmanthus.
Introduced weeds	Creeping lantana.
Soil	Dark, brown and red non-cracking clays.
Description	Surface: Hard-setting to weakly self-mulching; Surface texture: light clay; Subsoil texture: medium heavy clay.
Features	Weathered bedrock at depths of 65 cm (prairie). Small amounts of cobble but generally stone free.
Water availability	Low to moderate PAWC.
Drainage	Moderate
Rooting depth	Effective rooting depth variable 60–90 cm.
Fertility	Moderate to high; low to moderate nitrogen, very low to low phosphorus, moderate to high potassium.
Salinity	Very low (prairie) to moderate below 70 cm (non-cracking red clays).

Land Type

Sodicity	Non-sodic (prairie). Sodic below 25 cm to strongly sodic below 70 cm (red non-cracking).
pH	Neutral soil reaction trend (pH 6.5–7.5, prairie); alkaline soil reaction trend (pH 8.5–9.0 red non-cracking subsoils).
Long-term carrying capacity information (A condition)	Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day Median annual rainfall 629 – 754 mm

Pasture type	Median tree cover (TBA m2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	3430 - 3810	30%	2.6 – 2.8
	9 TBA 23 FPC	2020 - 2460	30%	4.0 – 4.8

Enterprise	Breeding and fattening.
Land use management and recommendations	– Suitable for grazing of native and improved pastures and short term only cropping. – Use of minimum tillage and maintenance of effective ground cover (>50%) and conservative stocking practices (spelling pastures, flexible stocking rates) are important to retain organic matter, maintain soil structure, reduce runoff and minimise risk of erosion. – Retain timber on ridges, in drainage lines and at changes of slope at base of hills to lower watertable and control salinity. – Burning is recommended every 2–3 years to control regrowth (ironbarks, wattles) and to enhance preferred pasture species.
Land use limitations	– Cloddy surface, PAWC and rockiness may restrict cultivation and crop establishment. – Cultivation can cause surface crusting which affects crop establishment. – Shallow effective rooting depth due to adverse subsoils conditions or rock. – High to very high erosion hazard, particularly prone to gully erosion where water is concentrated.
Conservation features and related management	– This woodland is an important wildlife habitat. Mature stands with numerous tree hollows are home to possums, koalas and gliders. The rough fissured bark of the ironbarks is ideal habitat for skinks and geckoes. – The grassy understorey provides habitat for ground fauna such as small marsupials (betongs), reptiles (frilled-neck lizards) and birds (quail) and is an important food source for the large macropods (whip-tailed wallabies, eastern grey kangaroos). – While large areas of this land type have been thinned for grazing, reasonably sized remnants remain. – The health of the landscape can be enhanced through appropriate fire regimes, grazing management an allowing regrowth to develop into effective wildlife corridors.
Regional Ecosystems	11.11.4, 11.12.3, 12.9–10.8.
Land resource area	Volcanic Uplands.

Narrow-Leaved Ironbark And Wattles A & B

A

Plant Species:	Black Speargrass, Silky Brown Top, Pitted Blue Grass, Cockatoo
Weeds:	Sida
Weed Abundance:	Slight
Pasture Density	High (Slightly Separated)
Pasture TSDM (kg/ha)	1800
Proportion	90%
Pasture Condition	Good
Ground Cover	High
Soil Condition	Stable
Land Condition	A
Wood Vegetation	Narrow-Leaved Ironbark, Hickory Wattle
Comments	Grazed

B

Plant Species:	Black Speargrass, Golden Beard Grass, Silky Brown Top, Reed Grass, White Speargrass
Weeds:	None
Weed Abundance:	None
Pasture Density	High (Slightly Separated)
Pasture TSDM (kg/ha)	1000
Proportion	60%
Pasture Condition	Fair
Ground Cover	High
Soil Condition	Stable
Land Condition	B
Wood Vegetation	Narrow-Leaved Ironbark, Hickory Wattle
Comments	Grazed

Narrow-Leaved Ironbark And Wattles C & D

C

Plant Species:	Golden Beard Grass, Cockatoo, Sedge, Secca, Black Speargrass
Weeds:	Sida
Weed Abundance:	Slight
Pasture Density	Moderate (Clearly Separated)
Pasture TSDM (kg/ha)	900
Proportion	30%
Pasture Condition	Very Poor
Ground Cover	Moderate
Soil Condition	Stable
Land Condition	C
Wood Vegetation	Narrow-Leaved Ironbark, Hickory Wattle
Comments	Grazed

D

Plant Species:	White Speargrass, Love Grass, Rat Tail, Silky Brown Top, Cockatoo
Weeds:	Sida
Weed Abundance:	Slight
Pasture Density	Low (Well Separated)
Pasture TSDM (kg/ha)	700
Proportion	10%
Pasture Condition	Very Poor
Ground Cover	Moderate
Soil Condition	Slight Disturbance
Land Condition	D
Wood Vegetation	Narrow-Leaved Ironbark, Hickory Wattle
Comments	Grazed

Narrow-Leaved Ironbark And Wattles

Landform	Crests and slopes of steep hills and mountains.
Woody vegetation	Woodland to open forest of narrow-leaved ironbark, silver-leaved, bloodwood, and spotted gum. If understorey present often wattles, rosewood, whitewood or beefwood.
Expected pasture composition	Southern black speargrass pastures. * Denotes non-native "Expected Pasture Composition" species.
Preferred	Black speargrass, barbwire grass, pitted bluegrass, native oatgrass, kangaroo grass.
Intermediate	Many-headed grass, kerosene grass, bottlewasher grasses.
Non-preferred	White speargrass.
Legumes	Narrow-leaved indigo, glycine pea.
Suitable sown pastures	Creeping bluegrass, fine stem stylo, shrubby stylo, Wynn cassia.
Introduced weeds	Lantern bush, blue heliotrope.
Soil	Shallow (<50 cm) loamy soils and shallow to moderately deep (<120 cm) texture contrast, gravelly soils.
Description	Surface: Hard-setting; Surface texture: loamy sand to sandy clay loam to clay loam; Subsoil texture: loamy sand to medium to medium heavy clay.
Features	Lithosols have very stony (surface cobble and gravel) shallow profiles. Often conspicuously bleached subsurface soils.
Water availability	Low to moderate PAWC.
Drainage	Well drained (lithosol) to poorly (texture contrast).
Rooting depth	Effective rooting depth 20–40 cm.
Fertility	Low; low nitrogen, low (texture contrast) to moderate (lithosol) phosphorus, moderate potassium.
Salinity	Non-saline.

Land Type

Sodicity	Non-sodic (lithosol); sodic (texture contrast) subsoils.
pH	Acidic surface (pH 5.5–6.5); neutral (pH 6.0–7.5) to alkaline subsoils (pH 7.8–8.6).
Long-term carrying capacity information (A condition)	Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day Median annual rainfall 629 – 754 mm

Pasture type	Median tree cover (TBA m2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	3440 - 3730	20%	3.9 – 4.2
	16 TBA 39 FPC	1210 - 1730	20%	8.5 – 12

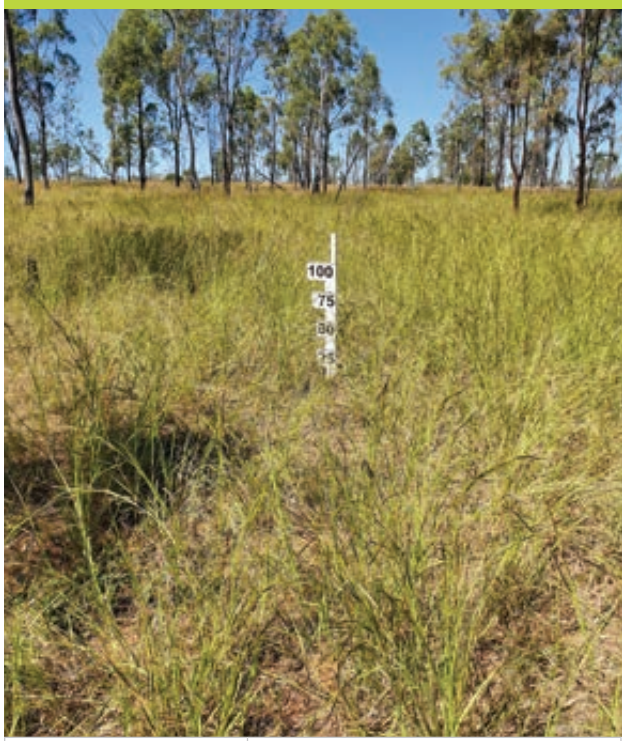
Enterprise	Breeding
Land use management and recommendations	– Suitable for grazing of native and improved pastures. – Maintenance of effective ground cover (>60%) and conservative stocking practices (spelling pastures, flexible stocking rates) are important to retain organic matter, maintain soil structure, reduce runoff and minimise risk of erosion. – Retain timber on ridges and at changes of slope at base of hills to lower watertable and control erosion (particularly tunnel erosion). – Burning is recommended every 2–3 years to control regrowth (ironbarks, wattles) and to enhance preferred pasture species.
Land use limitations	– Shallow effective rooting depth, very stony lithosol profiles. – Low PAWC, low to very low fertility. – Small seeded pasture difficult to establish due to rapid drying and sealing of sandy surface. – Narrow moisture range for successful cultivation. – Root development affected by impermeable and saline subsoils. – High erosion hazard and prone to scalding, gully and tunnel erosion.
Conservation features and related management	– This woodland is an important wildlife habitat with a surprisingly wide range of fauna. – Numerous tree hollows are home to possums and gliders. – The rough fissured bark provides good reptile habitat, for skinks and geckoes. – A good grass cover protects slopes and hillsides from erosion and provides habitat for ground fauna such as the painted button-quail. – Burning should not occur more frequently than once every three years and should take place in winter or just prior to summer rains. To maintain a diversity of habitat for wildlife it is better to burn patches rather than large areas. – Where these woodlands are grazed it is better to burn at a paddock level to prevent overgrazing of fresh growth. – The sandy soils are readily eroded.
Regional Ecosystems	11.7.4c, 11.12.1a, 12.5.1a, 12.7.1, 12.7.2, 12.11.19, 12.12.25.
Land resource area	Ranges.

Narrow-Leaved Ironbark On Granite A & B

A

Plant Species:	Black Spear Grass, Buffel, Pitted Blue Grass, Goldern Beard Grass, Scented Top
Weeds:	None
Weed Abundance:	None
Pasture Density	Very High (Touching)
Pasture TSDM (kg/ha)	3000
Proportion	95%
Pasture Condition	Good
Ground Cover	Very High
Soil Condition	Stable
Land Condition	A
Wood Vegetation	Narrow-leaved ironbark
Comments	Not recently grazed

B



Plant Species:	Black Spear Grass, Burnett Blue, Golden Beard Grass, White Speargrass, Pitted Bluegrass
Weeds:	None
Weed Abundance:	None
Pasture Density	High (Slightly Separated)
Pasture TSDM (kg/ha)	2000
Proportion	-
Pasture Condition	Good
Ground Cover	High
Soil Condition	Stable
Land Condition	B
Wood Vegetation	Narrow-Leaved Ironbark
Comments	Grazed

Narrow-Leaved Ironbark On Granite C & D

C

Plant Species:	Pitted Bluegrass, Golden Beard Grass, White Speargrass, Black Speargrass, Love Grass
Weeds:	None
Weed Abundance:	None
Pasture Density	Low (well separated)
Pasture TSDM (kg/ha)	1200
Proportion	-
Pasture Condition	Poor
Ground Cover	Moderate
Soil Condition	Slight disturbance
Land Condition	C
Wood Vegetation	Narrow-leaved ironbark, beefwood
Comments	Grazed

D

Plant Species:	Five Minute Grass, White Speargrass, Pitted Bluegrass, Black Speargrass, Native Panic
Weeds:	Sida
Weed Abundance:	Slight
Pasture Density	Very Low (Isolated)
Pasture TSDM (kg/ha)	200
Proportion	-
Pasture Condition	Very Poor
Ground Cover	Very Low
Soil Condition	Moderate Disturbance
Land Condition	D
Wood Vegetation	Narrow-Leaved Ironbark, Bloodwood
Comments	Grazed

Narrow-Leaved Ironbark On Granite

Landform	Undulating rises to rolling hills.
Woody vegetation	Open forest to woodland of Queensland blue gum, silver-leaved ironbark and narrowleaved ironbark. Understorey of wattle and minor beefwood.
Expected pasture composition	Southern black speargrass pastures. * Denotes non-native "Expected Pasture Composition" species.
Preferred	Black speargrass, red Natal grass*, silky umbrella grass, native millet.
Intermediate	Pitted bluegrass grass, bottlewasher grasses, slender chloris, barbwire grass.
Non-preferred	Golden beard grass, comet grass.
Legumes	Emu foot, glycine pea.
Annual grasses	Small burr grass.
Suitable sown pastures	Creeping bluegrass, fine stem stylo, shrubby stylo, Wynn cassia.
Introduced weeds	Blue heliotrope.
Soil	Shallow to moderately deep texture contrast soils.
Description	Surface: Hard-setting; Surface texture: loamy sand to sandy clay loam; Subsoil texture: sandy clay to medium clay.
Features	Stone free. Bleached subsurface layer, mottled subsoils.
Water availability	Low (yellow) to high (red) PAWC.
Drainage	Poorly drained (yellow) to moderately drained (red).
Rooting depth	Effective rooting depth 20 cm (yellow) to 60 cm (red).
Fertility	Low; low to moderate nitrogen, very low phosphorus, low to moderate to high potassium.

Land Type

Salinity	Low to non-saline.
Sodicity	Non-sodic (red), strongly sodic below 50 cm (yellow).
pH	Alkaline soil reaction trend, slightly acidic at surface, increasing alkalinity (pH 6.0–7.5) upper subsoils and moderately alkaline (7.8–8.6) in lower subsoils.
Long-term carrying capacity information (A condition)	Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day Median annual rainfall 694 – 785 mm

Pasture type	Median tree cover (TBA m2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	4760 - 5010	30%	2.1 – 2.2
	12 TBA 30 FPC	2040 - 2730	30%	3.6 – 4.8

Enterprise	Breeding and stores.
Land use management and recommendations	– Suitable for grazing of native and improved pastures, short-term cropping only on red soils. – Maintenance of effective ground cover (>50%) and conservative stocking practices (spelling pastures, flexible stocking rates) are important to retain organic matter, maintain soil structure, reduce runoff and minimise risk of erosion. – Retain timber on stony ridges and at changes of slope at base of hills to control erosion (particularly tunnel erosion). – Burning is recommended every 2–3 years to control regrowth (blue gum, ironbarks, wattles) and to enhance preferred pasture species.
Land use limitations	– Shallow effective rooting depth and poor internal drainage (yellow). – Low fertility. – Low PAWC will restrict dryland crop growth. – Hard-setting surface affects infiltration and cultivation. – Small seeded crops and pasture difficult to establish due to rapid drying and sealing of sandy surface. – Moderate erosion hazard on low to moderate slopes (red). – Very high erosion hazard and particularly prone to tunnel erosion (yellow).
Conservation features and related management	– Extensively cleared for native pasture in some areas; relatively intact in others. – These are generally grassy woodlands that provide habitat for larger marsupials. – Hollow-bearing habitat trees are important nesting sites for birds and arboreal mammals. – Landscape health can be enhanced through appropriate fire regimes, grazing management an allowing regrowth to develop into effective wildlife corridors.
Regional Ecosystems	12.12.23, 12.12.12.
Land resource area	Granite Hills.

Silver-Leaved Ironbark On Clay A & B

A

Plant Species:	Black Speargrass, Burnett Blue, Native Glycine
Weeds:	Sida Species
Weed Abundance:	Slight
Pasture Density	Very High (Touching)
Pasture TSDM (kg/ha)	2500
Proportion	100%
Pasture Condition	Good
Ground Cover	Very High
Soil Condition	Stable
Land Condition	A
Wood Vegetation	Silver-Leaved Ironbark
Comments	Some grazing recently

B

Plant Species:	Burnett Blue, Black Speargrass, White Speargrass, Rinchosia, Queensland Bluegrass, Stylo
Weeds:	Sida
Weed Abundance:	-
Pasture Density	Moderate (Clearly Separated)
Pasture TSDM (kg/ha)	1000
Proportion	75%
Pasture Condition	Fair
Ground Cover	High
Soil Condition	Stable
Land Condition	B
Wood Vegetation	Silver-Leaved Ironbark, Canthium
Comments	Some grazing

Silver-Leaved Ironbark On Clay C & D

C

Plant Species:	White Speargrass, Buffel, Red Natal, Burnett Blue, Black Speargrass
Weeds:	Sida, Flannel Weed, Galvanised Burr, Prickly Pear
Weed Abundance:	Moderate
Pasture Density	High (Slightly Separated)
Pasture TSDM (kg/ha)	1200
Proportion	50%
Pasture Condition	Poor
Ground Cover	Moderate
Soil Condition	Stable
Land Condition	C
Wood Vegetation	Silver-Leaved Ironbark, Canthium Species, Red Ash
Comments	No grazing

D

Plant Species:	White Speargrass, Native Rats Tail, Black Speargrass, Pitted Blue Grass, Love Grass
Weeds:	Sida
Weed Abundance:	Slight
Pasture Density	Very Low (Isolated)
Pasture TSDM (kg/ha)	100
Proportion	10%
Pasture Condition	Very Poor
Ground Cover	Very Low
Soil Condition	Moderate disturbance
Land Condition	D
Wood Vegetation	Poplar Box
Comments	Continuous grazing

Silver-Leaved Ironbark On Clay

Landform	Undulating rises to rolling hills.
Woody vegetation	Open forest to woodland of Queensland blue gum, silver-leaved ironbark and narrowleaved ironbark. Understorey of wattle and minor beefwood.
Expected pasture composition	Southern black speargrass pastures. * Denotes non-native "Expected Pasture Composition" species.
Preferred	Black speargrass, red Natal grass*, silky umbrella grass, native millet.
Intermediate	Pitted bluegrass grass, bottlewasher grasses, slender chloris, barbwire grass.
Non-preferred	Golden beard grass, comet grass.
Legumes	Emu foot, glycine pea.
Annual grasses	Small burr grass.
Suitable sown pastures	Creeping bluegrass, fine stem stylo, shrubby stylo, Wynn cassia.
Introduced weeds	Blue heliotrope.
Soil	Shallow to moderately deep texture contrast soils.
Description	Surface: Hard-setting; Surface texture: loamy sand to sandy clay loam; Subsoil texture: sandy clay to medium clay.
Features	Stone free. Bleached subsurface layer, mottled subsoils.
Water availability	Low (yellow) to high (red) PAWC.
Drainage	Poorly drained (yellow) to moderately drained (red).
Rooting depth	Effective rooting depth 20 cm (yellow) to 60 cm (red).
Fertility	Low; low to moderate nitrogen, very low phosphorus, low to moderate to high potassium.

Land Type

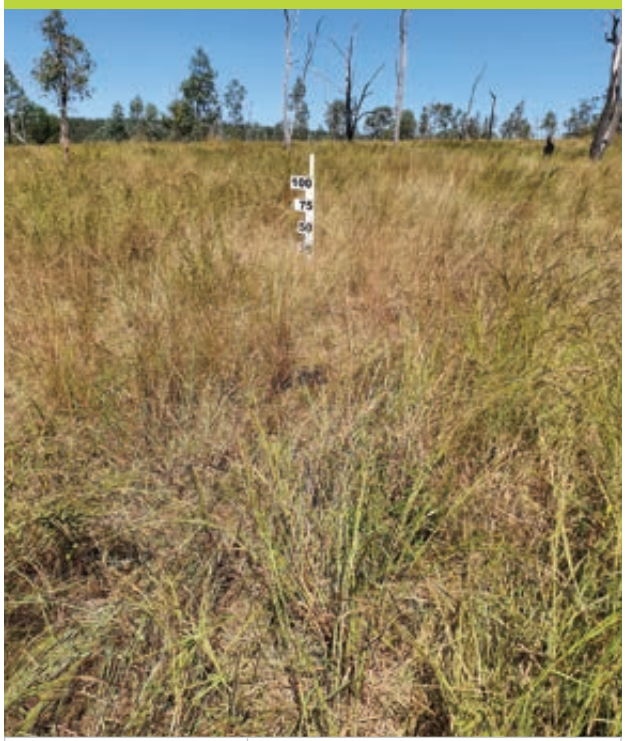
<table>
<tr><td>Salinity</td><td>Low to non-saline.</td></tr>
<tr><td>Sodicity</td><td>Non-sodic (red), strongly sodic below 50 cm (yellow).</td></tr>
<tr><td>pH</td><td>Alkaline soil reaction trend, slightly acidic at surface, increasing alkalinity (pH 6.0–7.5) upper subsoils and moderately alkaline (7.8–8.6) in lower subsoils.</td></tr>
<tr><td>Long-term carrying capacity information (A condition)</td><td>
<table>
<tr><td colspan="5">Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day</td></tr>
<tr><td colspan="5">Median annual rainfall 694 – 785 mm</td></tr>
<tr><td>Pasture type</td><td>Median tree cover (TBA m2/ha) (FPC %)</td><td>Median annual pasture growth (DM kg/ha)</td><td>Safe annual utilisation pasture growth (%)</td><td>LTCC (ha/AE)</td></tr>
<tr><td>Native species</td><td>0 TBA/FPC</td><td>4760 - 5010</td><td>30%</td><td>2.1 – 2.2</td></tr>
<tr><td></td><td>12 TBA
30 FPC</td><td>2040 - 2730</td><td>30%</td><td>3.6 – 4.8</td></tr>
</table>
</td></tr>
<tr><td>Enterprise</td><td>Breeding and stores.</td></tr>
<tr><td>Land use management and recommendations</td><td>- Suitable for grazing of native and improved pastures, short-term cropping only on red soils.
- Maintenance of effective ground cover (>50%) and conservative stocking practices (spelling pastures, flexible stocking rates) are important to retain organic matter, maintain soil structure, reduce runoff and minimise risk of erosion.
- Retain timber on stony ridges and at changes of slope at base of hills to control erosion (particularly tunnel erosion).
- Burning is recommended every 2–3 years to control regrowth (blue gum, ironbarks, wattles) and to enhance preferred pasture species.</td></tr>
<tr><td>Land use limitations</td><td>- Shallow effective rooting depth and poor internal drainage (yellow).
- Low fertility.
- Low PAWC will restrict dryland crop growth.
- Hard-setting surface affects infiltration and cultivation.
- Small seeded crops and pasture difficult to establish due to rapid drying and sealing of sandy surface.
- Moderate erosion hazard on low to moderate slopes (red).
- Very high erosion hazard and particularly prone to tunnel erosion (yellow).</td></tr>
<tr><td>Conservation features and related management</td><td>- Extensively cleared for native pasture in some areas; relatively intact in others.
- These are generally grassy woodlands that provide habitat for larger marsupials.
- Hollow-bearing habitat trees are important nesting sites for birds and arboreal mammals.
- Landscape health can be enhanced through appropriate fire regimes, grazing management an allowing regrowth to develop into effective wildlife corridors.</td></tr>
<tr><td>Regional Ecosystems</td><td>12.12.23, 12.12.12.</td></tr>
<tr><td>Land resource area</td><td>Granite Hills.</td></tr>
</table>

Silver-Leaved Irondbark On Granite A & B

A

Plant Species:	Black Speargrass, White Spear, Secca, Barb Wire, Green Panic
Weeds:	Sida
Weed Abundance:	Slight
Pasture Density	Very High (Touching)
Pasture TSDM (kg/ha)	3000
Proportion	-
Pasture Condition	Good
Ground Cover	Very High
Soil Condition	Stable
Land Condition	A
Wood Vegetation	Broad-Leaved Ironbark Regrowth
Comments	Grazed

B



Plant Species:	Black Speargrass, Pitted Blue, White Speargrass, Buffel, Golden Beard, Secca
Weeds:	Sida
Weed Abundance:	-
Pasture Density	High (Slightly Separated)
Pasture TSDM (kg/ha)	1500
Proportion	-
Pasture Condition	Fair
Ground Cover	Moderate
Soil Condition	Stable
Land Condition	B
Wood Vegetation	Broad-Leaved Ironbark, Goodwood Regrowth
Comments	Grazed

Silver-Leaved Irondbark On Granite C & D

C

Plant Species:	White Speargrass, Gayndah Buffel, Pitted Bluegrass, Black Speargrass, Love Grass
Weeds:	None
Weed Abundance:	None
Pasture Density	High (Slightly Separated)
Pasture TSDM (kg/ha)	1200
Proportion	50%
Pasture Condition	Poor
Ground Cover	High
Soil Condition	Stable
Land Condition	C
Wood Vegetation	Broad-Leaved Ironbark
Comments	Not recently grazed

D

Plant Species:	White Speargrass, Black Speargrass, Red Natal, Pitted Bluegrass
Weeds:	Sida, Euphorbia
Weed Abundance:	Slight
Pasture Density	Very Low (Isolated)
Pasture TSDM (kg/ha)	200
Proportion	-
Pasture Condition	Very Poor
Ground Cover	Very Low
Soil Condition	Very Severe Disturbance
Land Condition	D
Wood Vegetation	Broad-Leaved Ironbark
Comments	Not grazed

Silver-Leaved Irondbark On Granite

Landform	Undulating rises with broad hill crests on granite.
Woody vegetation	Open forest to woodland of silver-leaved ironbark, narrow-leaved ironbark and Queensland blue gum. Understorey of wattles and minor beefwood.
Expected pasture composition	Southern black speargrass pastures. * Denotes non-native "Expected Pasture Composition" species
Preferred	Black speargrass, red Natal grass*, barbwire grass.
Intermediate	Pitted bluegrass grass, many-headed wiregrass, silky umbrella grass, feathertop Rhodes grass*.
Non-preferred	Dark wiregrass, reedgrass, golden beard grass.
Legumes	Rattlepods, Birdsville indigo, glycine pea.
Suitable sown pastures	Creeping bluegrass, fine stem stylo, shrubby stylo, Wynn cassia.
Introduced weeds	-
Soil	Shallow to moderately deep yellow, red or brown texture contrast soils.
Description	Surface: Hard-setting; Surface texture: loamy sand to sandy clay loam; Subsoil texture: medium clay.
Features	Stone free.
Water availability	Low (yellow) to high (red) PAWC.
Drainage	Poorly drained (yellow) to moderately drained (red).
Rooting depth	Effective rooting depth 20 cm (yellow) to 60 cm (red).
Fertility	Low; low to moderate nitrogen, very low phosphorus, low to moderate to high potassium.
Salinity	Low to non-saline.

Land Type

Sodicity	Non-sodic (red), strongly sodic below 50 cm (yellow).
pH	Alkaline soil reaction trend, slightly acidic at surface, increasing alkalinity (pH 6.0–7.5) upper subsoils and moderately alkaline (7.8–8.6) in lower subsoils.
Long-term carrying capacity information (A condition)	Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day Median annual rainfall 694 – 785 mm

Pasture type	Median tree cover (TBA m2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	2860	30%	3.4
	10 TBA 25 FPC	1380 - 1480	30%	6.6 – 7.1

Enterprise	Breeding and stores.
Land use management and recommendations	– Suitable for grazing of native and improved pastures, short-term cropping only on red soils. – Maintenance of effective ground cover (>50%) and conservative stocking practices (spelling pastures, flexible stocking rates) are important to retain organic matter, maintain soil structure, reduce runoff and minimise risk of erosion. – Retain timber on stony ridges and at changes of slope at base of hills to control erosion (particularly tunnel erosion). – Burning is recommended every 2–3 years to control regrowth (blue gum, ironbarks, wattles) and to enhance preferred pasture species.
Land use limitations	– Shallow effective rooting depth and poor internal drainage (yellow). – Low fertility. – Low PAWC will restrict dryland crop growth. – Hard-setting surface affects infiltration and cultivation. – Small seeded crops and pasture difficult to establish due to rapid drying and sealing of sandy surface. – Moderate erosion hazard on low to moderate slopes (red). – Very high erosion hazard and particularly prone to tunnel erosion (yellow).
Conservation features and related management	– Older silver-leaved ironbark trees frequently have hollows favoured by brushtail possums. The deep-fissured bark provides shelter for reptiles, such as tree skinks. – Generally the good grass cover provides shelter and food for ground dwelling animals such as wallabies and rufous bettongs. – Trees are important in the cycling of nutrients from deeper in the soil profile. – Patch burning of these woodlands in the late winter months is preferable. – Mature trees can easily be burnt through at the base and therefore frequent burning can lead to loss of these important habitat trees.
Regional Ecosystems	11.9.2.
Land resource area	Granite Hills.

Softwood Scrub A & B

A

Plant Species:	Gayndah Buffel, Biloela Buffel
Weeds:	None
Weed Abundance:	None
Pasture Density	Very High (Touching)
Pasture TSDM (kg/ha)	6000
Proportion	100%
Pasture Condition	Good
Ground Cover	Very High
Soil Condition	Stable
Land Condition	A
Wood Vegetation	Bottle Tree, Wilga Regrowth
Comments	Some grazing recently

B

Plant Species:	Burnett Bluegrass, Buffel, Black Speargrass, Wiregrass Burr, Button Grass, Galvenised, Red Natal, Sida, Brigalow Grass
Weeds:	Galvanised Burr
Weed Abundance:	None
Pasture Density	High
Pasture TSDM (kg/ha)	1800
Proportion	85%
Pasture Condition	Fair
Ground Cover	High
Soil Condition	Slight Disturbance
Land Condition	B
Wood Vegetation	Bottle Tree, Wilga, Currant Bush, Ooline Tree
Comments	Bit of sheet erosion as well. Cattle pad crosses site.

Softwood Scrub C & D

C

Plant Species:	Brigalow Grass, Dark Wiregrass, Purple Wiregrass, Sida
Weeds:	Parthenium
Weed Abundance:	Slight
Pasture Density	Very High
Pasture TSDM (kg/ha)	2100
Proportion	25%
Pasture Condition	Poor
Ground Cover	Very High
Soil Condition	Moderate Disturbance
Land Condition	C
Wood Vegetation	Sandpaper Fig, Wilga, Bottle Tree, Bauhinia
Comments	-

D

Plant Species:	Sida, Fairygrass
Weeds:	Rubbervine
Weed Abundance:	Slight
Pasture Density	Very Low (Isolated)
Pasture TSDM (kg/ha)	100
Proportion	0
Pasture Condition	Very Poor
Ground Cover	Moderate
Soil Condition	Moderate Disturbance
Land Condition	D
Wood Vegetation	Brigalow, Belah, Wigla, Wallaby Apple
Comments	-

Softwood Scrub

Landform	Mid to upper slopes and crests of gently sloping remnant plateaus and near scarp margins; slopes below scarps; and low hills adjacent to plateau remnants.
Woody vegetation	Softwood scrub (vines, bottle trees, white cedar, crows ash, figs) and open forest to open woodland of narrow-leaved ironbark in association with Queensland blue gum, blackbutt, spotted gum, Gympie messmate, grey gum, tallowwood or Yarraman ironbark depending on landscape position. Occasional bloodwoods, rusty gums, she-oaks and silver-leaved ironbarks with an understorey of wattles, red ash and dogwood.
Expected pasture composition	* Denotes non-native "Expected Pasture Composition" species.
Preferred	Green panic*
Intermediate	-
Non-preferred	Wiregrasses
Legumes	Woolly glycine, glycine pea.
Suitable sown pastures	Green panic, Rhodes grass, buffel grass, Gatton panic, digit grass, tall finger grass, shrubby stylo, Caatinga stylo, Wynn cassia, siratro, leucaena.
Introduced weeds	Lantana
Soil	Shallow (red earths) to deep red clay loams (krasnozems) and brown non-cracking clays (prairie soils).
Description	Surface: loose to crusting, when firm can be loose when dry; Surface texture: loam to clay loam to light clay; Subsoil texture: clay loam to light clay to medium clay.
Features	Ironstone and gravel present in small (krasnozems) and large (red earth) amounts in subsoils. Occasional gravel in prairie soils.
Water availability	Low (red earths) to moderate PAWC (krasnozems, prairie).
Drainage	Well drained (krasnozems, prairie, red earths).
Rooting depth	Effective rooting depth >60 cm (red earths) >100 cm (prairie, krasnozems).

Land Type

Fertility	Moderate to very high; moderate (krasnozems) to high (prairie) to very high (red earths) nitrogen, moderate (krasnozems, red earths) to very high (prairie) phosphorus, high (krasnozems) to very high (prairie, red earths) potassium.
Salinity	Very low saline surface, non-saline below (krasnozems, prairie, red earths).
Sodicity	Non-sodic (krasnozems, prairie, red earths).
pH	Moderately acidic (pH 5.5 to 6.0, red earths) to slightly acidic (pH 6.0–6.5, krasnozems) to neutral (pH 7.0, prairie) at surface; increasing acidity (pH 5.0–5.5 red earths, 6.0 krasnozems) and increasing alkalinity (pH >8.5 below 50 cm, prairie) down profile.
Long-term carrying capacity information (A condition)	Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day Median annual rainfall 694 – 785 mm

Pasture type	Median tree cover (TBA m2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	5220 - 5430	30% (sown)	1.8 – 1.9
	20 TBA 47 FPC	1880 - 2450	30% (sown)	4.0 – 5.2

Enterprise	Fattening
Land use management and recommendations	– Suitable for grazing of native and improved pastures and cropping, short term only on prairie soils. – Use of minimum tillage and maintenance of effective ground cover (>50%) and conservative stocking practices (spelling pastures, flexible stocking rates) are important to retain organic matter, maintain soil structure, reduce runoff and minimise risk of erosion. – Retain timber on ridges, in drainage lines and at changes of slope at base of hills to lower watertable and control salinity.
Land use limitations	– Low plant available water; shallow effective rooting depth; stoniness of subsoils; acidic soils. – Moderate to high erosion hazard due to low to moderate erodibility and moderate to steep slopes.
Conservation features and related management	– Very few scrub remnants remain, and those that do are small and isolated. – Habitat for rare and threatened flora and fauna. – Remnants are threatened by weed invasion and fire on their margins. – The use of fire breaks and cool season burns reduce this risk. – Natural regeneration should
Regional Ecosystems	11.5.15, 11.9.4a, 11.9.4c, 11.11.5a, 12.5.1b, 12.5.13, 12.8.13, 12.8.21, 12.12.18, 12.5.13ac.
Land resource area	Undulating Plains; Red Tablelands.

Spotted Gum Ridges A & B

A

Plant Species:	Pitted Bluegrass, Golden Beard Grass, Bottlewasher Grass, Native Legume, White Speargrass
Weeds:	Prickly Pear
Weed Abundance:	Slight
Pasture Density	High (Slightly Separated)
Pasture TSDM (kg/ha)	1000
Proportion	80%
Pasture Condition	Good
Ground Cover	Very High
Soil Condition	Stable
Land Condition	A
Wood Vegetation	Spotted Gum, Narrow-Leaved Ironbark, Wattle
Comments	Not grazed recently

B

Plant Species:	Pitted Bluegrass, Bottlewasher Grass, White Speargrass, Love Grass, Chloris
Weeds:	Sida
Weed Abundance:	Slight
Pasture Density	High (Slightly Separated)
Pasture TSDM (kg/ha)	900
Proportion	70%
Pasture Condition	Fair
Ground Cover	Moderate
Soil Condition	Stable
Land Condition	B
Wood Vegetation	Spotted Gum, Narrow-Leaved Ironbark, Wattle
Comments	Not grazed recently

Spotted Gum Ridges C & D

C

Plant Species:	Pitted Bluegrass, Arundinella Reed Grass, White Speargrass, Shot Grass, Love Grass
Weeds:	None
Weed Abundance:	None
Pasture Density	Moderate (Clearly Separated)
Pasture TSDM (kg/ha)	800
Proportion	10%
Pasture Condition	Very Poor
Ground Cover	Moderate
Soil Condition	Stable
Land Condition	C
Wood Vegetation	Spotted Gum, Narrow-Leaved Ironbark, Wattle
Comments	Not recently grazed

D

Plant Species:	White Speargrass, Spinifex
Weeds:	-
Weed Abundance:	Moderate
Pasture Density	Very Low (Isolated)
Pasture TSDM (kg/ha)	20
Proportion	0%
Pasture Condition	Very Poor
Ground Cover	Very Low
Soil Condition	Very Severe Disturbance
Land Condition	D
Wood Vegetation	Spotted Gum, Narrow-Leaved Ironbark, Canthium
Comments	Possible effects from logging in the distant past

Spotted Gum Ridges

Landform	Crests and hillslopes of undulating rises to low hills to mountains.
Woody vegetation	Spotted gum open forest or woodland frequently associated with narrow-leaved ironbark. Other species that may occur include bloodwoods, rusty gum, and gum-topped box. An understorey may include red ash, currant bush, grevilleas and wattles.
Expected pasture composition	Wiregrass – pitted bluegrass pastures. * Denotes non-native "Expected Pasture Composition" species.
Preferred	Black speargrass, barbwire grass, pitted bluegrass, native oatgrass, kangaroo grass.
Intermediate	Erect kerosene grass, kerosene grass, silkyheads.
Non-preferred	Dark wiregrass, five-minute grass, comet grass.
Legumes	Rattlepods, glycine pea.
Suitable sown pastures	None suitable.
Introduced weeds	Lantern bush.
Soil	Very shallow to shallow (<50 cm) sandy, loamy lithosols.
Description	Surface: Loose to hard-setting; Surface texture: loamy sand; Subsoil texture: loamy sand to weathered bedrock.
Features	Very stony profiles, with surface cobble and gravel, frequent rock outcrops.
Water availability	Low PAWC.
Drainage	Well drained.
Rooting depth	Effective rooting depth 20 cm.
Fertility	Low; very low nitrogen, moderate phosphorus, moderate potassium.
Salinity	Low

Land Type

Sodicity	Non-sodic.
pH	Acid (pH 5.8–6.5) soil reaction trend.
Long-term carrying capacity information (A condition)	Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day Median annual rainfall 694 – 785 mm

Pasture type	Median tree cover (TBA m2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	2580 - 2940	20%	5.0 – 5.7
	14 TBA 34 FPC	670 - 1540	20%	9.5 – 22

Enterprise	Breeding
Land use management and recommendations	– Suitable for light grazing of native pastures. – Maintenance of effective ground cover (>60%) and conservative stocking practices (spelling pastures, flexible stocking rates) are important to retain organic matter, maintain soil structure, reduce runoff and minimise risk of erosion. – Retain timber to lower watertable and control erosion. – Burning is recommended every 2–3 years to control regrowth (ironbarks, wattles, red ash) and to enhance preferred pasture species.
Land use limitations	– Shallow effective rooting depth, very stony profiles. – Low PAWC, very low fertility. – Very high erosion hazard.
Conservation features and related management	– These extensive spotted gum forests provide valuable resources for a suite of forest dependent fauna including possums and gliders, koalas, forest owls, microbats, and insectivorous birds. The more enigmatic species include the yellow-bellied glider and the greater glider, the powerful owl, the red goshawk, and little pied bat. – Coral snakes and bandy-bandy snakes are found in this land type. – This land type is seasonally important as a nectar/pollen source for bees. – Large fallen trees are good habitat for ground dwelling animals. – Areas that have been extensively managed for timber have been modified through selective thinning and frequent fire resulting in even aged stands with minimal habitat trees and poor stand succession. – Retaining adequate numbers of habitat trees is important for forest health and biodiversity. – The careful use of fire (especially following disturbance such as thinning or harvesting) allows forest regeneration and can be pro-actively used
Regional Ecosystems	11.7.5, 11.7.6, 11.10.1, 11.11.4a, 11.12.6, 12.12.10.
Land resource area	Ranges.

Tea Tree Flats A & B

A

Plant Species:	Black Speargrass, Golden Beard Grass, Forest Bluegrass, Kangaroo Grass, Secca Stylo, Indian Couch, Giant Parramatta Grass, Snakeweed
Weeds:	Indian Couch, Giant Paramatta Grass, Snakeweed
Weed Abundance:	Slight
Pasture Density	Very High (Touching)
Pasture TSDM (kg/ha)	4000
Proportion	90%
Pasture Condition	Good
Ground Cover	Very High
Soil Condition	Stable
Land Condition	A
Wood Vegetation	Narrow-Leaved Ironbark, Cabbage Gum, Bloodwood
Comments	-

B

Plant Species:	Black Speargrass, Golden Beard Grass, Blue Couch, Paramatta Grass
Weeds:	Paramatta Grass
Weed Abundance:	Moderate
Pasture Density	Very High (Touching)
Pasture TSDM (kg/ha)	3500
Proportion	70%
Pasture Condition	Fair
Ground Cover	Very High
Soil Condition	Stable
Land Condition	B
Wood Vegetation	Tea Tree, Bloodwood,
Comments	-

Tea Tree Flats C & D

C

Plant Species:	Paramatta Grass, Black Speargrass, Golden Beard Grass, Blue Couch, Indian Couch, Woodland Love Grass, Secca
Weeds:	Paramatta Grass
Weed Abundance:	Abundant
Pasture Density	Very High (Touching)
Pasture TSDM (kg/ha)	3500
Proportion	40%
Pasture Condition	Poor
Ground Cover	Very High
Soil Condition	Stable
Land Condition	C
Wood Vegetation	Broad-Leaved Tea Tree, Bloodwood, Poplar Box
Comments	-

D

Plant Species:	Dark Wiregrass, Purple Lovegrass, Sida
Weeds:	-
Weed Abundance:	None
Pasture Density	Low (Well Separated)
Pasture TSDM (kg/ha)	200
Proportion	10%
Pasture Condition	Very Poor
Ground Cover	Moderate
Soil Condition	Moderate Disturbance
Land Condition	D
Wood Vegetation	Poplar Gum, Myrtle, Paper-Bark, Tea Tree
Comments	-

Tea Tree Flats

Landform	Level alluvial plains (moderately extensive).
Woody vegetation	Paperbark tea tree, bloodwoods, blue gum, swamp mahogany.
Expected pasture composition	* Denotes non-native “Expected Pasture Composition” species
Preferred	Golden beard grass, black speargrass, kangaroo grass.
Intermediate	Queensland blue couch*.
Non-preferred	Poverty grass.
Suitable sown pastures	Pangola grass, humidicola, lotononis, villomix.
Introduced weeds	Giant rat’s tail grass, groundsel bush.
Soil	Soloths, solodics, podzols (sodosols, kurosols).
Description	Surface: Hard-setting; Surface texture: sandy loam to clay loam; Subsoil texture: light to medium to heavy clay.
Water availability	Low (shallow rooting depth and low PAWC).
Infiltration	Slow (hard-setting surface).
Drainage	Impermeable subsoil; poorly drained.
Fertility	Very low to low nitrogen; very low phosphorus.
Salinity	May be saline.
Sodicity	Sodic to strongly sodic subsoil.
pH	Slightly acidic; increasing to strongly alkaline at depth (solodics).

Land Type

Soloth

Depth (cm)	Description
0–15	Grey, fine sandy loam. Massive structure. Hard setting surface; pH 5.8. Diffuse to …
15–45	… light grey, clayey sand. Massive structure. pH 6.0. Abrupt change to …
45–90	… brown and orange mottled, yellow brown, sandy light clay. Weak prismatic structure; pH 4.8. Gradual change to …
90–110	… orange mottled, grey light clay. Strong angular blocky structure; pH 5.3.

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day

Median annual rainfall 694 – 785 mm

Pasture type	Median tree cover (TBA m2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	2370 - 2440	25%	4.8 – 4.9
	25 TBA 57 FPC	< 260 - 270	25%	> 43 - 45
Sown			30%	

Enterprise

Breeding and stores.

Land use management and recommendations

- Infertile land type with limited development potential.
- Acute phosphorous (and in some cases calcium) deficiency in cattle. Particularly severe in lactating cows.
- Fire is effective in managing woody regrowth and woodland thickening.

Land use limitations

- Woody regrowth problems.
- Erosive subsoils; seasonal water-logging; poor fertility.
- Grazing animals exhibit acute phosphorous deficiency. Soils with high magnesic subsoils can lead to calcium deficiency in cattle.

Conservation features and related management

- Habitat for sedges and ferns and rare and threatened flora including swamp orchids Phaius australis and P. tancarvilleae.
- Important habitat for migratory woodland birds (kingfishers, whistlers and robins) and important seasonal habitat for frogs.
- The autumn and spring flowering cycles of various plants attract lorikeets and honey eaters.
- Remnants are particularly susceptible to weed invasion on their margins.
- Landscape connectivity is important for wildlife corridors.

Regional Ecosystems

12.2.5, 12.2.7, 12.2.7a, 12.2.7c, 12.3.4, 12.3.4a, 12.3.5, 12.3.6, 12.5.4a, 12.9–10.10

Land resource area

Alluvium (major); sandplain and coastal plain (minor) (Glanville et al 1991).

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BMRG
Ecosystem Resilience

Land Condition Photo Standards for the Burnett River Catchment Area Grazing Lands 2023