

Southern Gulf region Grazing Land Management land type information

Land types

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Southern Gulf Region Plant Index

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calotrope* <i>see also</i> cabbage tree*	<i>Calotropis procera</i>	SG02 SG04 SG05 SG10 SG13 SG14
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Cloncurry box	<i>Eucalyptus leucophylla</i>	SG10 SG11
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Cooktown ironwood	<i>Erythrophleum chlorostachys</i>	
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cup grass	<i>Eriochloa creba</i>	SG02 SG09
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Flinders grass	<i>Iseilema sp.</i>	SG02 SG03 SG05 SG09
Flinders poppy	<i>Pimelea decora</i>	SG09
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giant speargrass	<i>Heteropogon triticeus</i>	SG01 SG04 SG06
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hoop Mitchell grass	<i>Astrebla elymoides</i>	SG02
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Common name	Scientific name	Page
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Ipomoea see also cow vine	<i>Ipomoea lonchophylla</i>	SG02 SG09
Ironbark/s	<i>Eucalyptus crebra</i> , <i>E. melanophloia</i> , <i>E. whitei</i>	SG01 SG06
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kangaroo grass	<i>Themeda triandra</i>	SG01 SG06 SG07 SG10 SG12 SG13 SG14
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kersosene grass	<i>Aristida contorta</i>	SG07 SG12
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large leaf cabbage gum	<i>Croymbia grandifolia</i>	SG03
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Leichhardt's tree	<i>Nauclea orientalis</i>	SG04
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marsh wort	<i>Nymphoides</i> species	SG03
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nardoo	<i>Marsilea drummondii</i>	SG04
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Normanton box	<i>Eucalyptus normantonensis</i>	SG07
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northern wanderrie grass	<i>Eriachne obtusa</i>	
north-west ghost gum	<i>Corymbia bella</i>	SG04
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onion vine <i>see also</i> paper rose	<i>Operculina aequisepala</i>	SG02 SG09
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panic grasses	<i>Panicum</i> sp. (eg. <i>P. simile</i>)	SG03 SG06
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Reid river box	<i>Eucalyptus brownii</i>	

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soft roly poly	<i>Salsola kali</i>	SG10 SG13
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Speedyweed	<i>Eleocharis</i> spp	SG09

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spurge	<i>Phyllanthus</i> sp.	
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summer grass	<i>Chionachne hubbardiana</i>	SG02 SG09
supplejack see <i>also</i> vine tree	<i>Ventilago viminalis</i>	SG05 SG09
tarvine	<i>Boerhavia</i> sp.	SG02 SG09
tassel bluegrass	<i>Dichanthium sericeum</i>	SG02
tephrosia	<i>Tephrosia</i> sp.	
tickweed	<i>Cleome viscosa</i>	SG09 SG10 SG13 SG14
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turpentine	<i>Acacia chisholmii</i> and <i>A. lysiphloia</i>	SG11 SG14
umbrella canegrass	<i>Leptochloa digitata</i>	SG09
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wanderrie grass/es	<i>Eriachne</i> spp.	SG03 SG04 SG05 SG06 SG07 SG10 SG11 SG12 SG13 SG14
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white speargrass	<i>Aristida leptopoda</i>	SG01 SG06
whitewood	<i>Atalaya hemiglauca</i>	SG01 SG02 SG05 SG09 SG13 SG14
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windmill grass/es	<i>Chloris</i> spp.	SG02 SG04 SG05
winged nut tree	<i>Terminalia canescens</i>	SG11 SG13
wiregrass/es see <i>also</i> feathertop, white speargrass	<i>Aristida</i> spp.	SG01 SG02 SG03 SG04 SG05 SG06 SG07 SG10 SG11 SG12 SG13 SG14

* Denotes non-native species

Basalt



Landform	Basalt undulating plains, rolling hills and plateaux.
Woody vegetation	Ironbarks, bloodwoods, open woodland characterised by whitewood, ghost gum, coolibah and bauhinia.
Expected pasture composition	<i>* Denotes non-native species</i>
Preferred	Black speargrass, Queensland bluegrass, kangaroo grass, forest bluegrass, desert bluegrass, plume sorghum.
Intermediate	Pitted bluegrass, golden beard grass, Indian couch*, white grass, canegrass, giant speargrass.
Non-preferred	Wiregrasses (eg: feathertop, white speargrass)
Annual grasses	Native couch, hairy armgrass, button grass, weeping lovegrass.
Common forbs	Rattlepods, rhynchosia, vernonia, indigofera.
Suitable sown pastures	Oversow with legumes; Shrubby stylo (e.g. Seca) (lighter soils), Caatingo stylo and Desmanthus.
Introduced weeds	Rubbervine, grader grass, stinking passionfruit, prickly acacia.

Soil	Predominantly black earths (vertisols) with minor areas of red basalt (ferrosols)
Description	Surface: Self mulching black earths with potential to crack, soft (red basalt), both with varying level of basalt stones; Surface texture: medium to heavy clay; Sub-soil texture: medium to heavy clay.
Features	Little white Carbonate nodules may occur in black earths. Presence of basalt stones varies from sparse to almost complete boulder coverage.
Water availability	Red Basalt: moderate water holding capacity with medium to rapid internal drainage. Black Earths: moderate to very high water holding capacity with moderate to slow internal drainage.
Rooting depth	Shallow to moderate.
Infiltration	Moderate to high.
Fertility	Moderate to high. Tendency to be low in salt and sulphur.
Chloride	Low to very low.
Sodium	Non-sodic.
pH	Alkaline (black earths): neutral to slightly acidic (red basalt/ferrosols).
Utilisation	20%
Enterprise	Breeding and fattening.
Land use and management recommendations	<ul style="list-style-type: none"> • Use combination of control methods (fire, chemical, mechanical and biological) as management tool to control woody weeds • Maintenance of ground cover to minimise shrub invasion and wind and water (gully) erosion.
Land use limitations	<ul style="list-style-type: none"> • Timber thickening can limit productivity. • Basalt stone cover affects infrastructure development eg: fences, roads, stock water.
Conservation features and related management	<ul style="list-style-type: none"> • Subject to high grazing pressure. • Subject to weed infestation by rubbervine (<i>Cryptostegia grandiflora</i>) and grader grass (<i>Themeda quadrivalvis</i>) and invasive exotic weed species such as mimosa (<i>Acacia farnesiana</i>) that may change the community to a tall open shrubland.
Regional ecosystems	1.12.5, 9.3.11, 9.8.13, 9.8.1a, 9.8.5a-b, 9.8.9.
Land Systems	Rosella (59), Boonderoo (60) (Perry 1964), Land zone F (Fox <i>et al</i> 2001)

Bluegrass browntop plains



Landform	Open grassland, flat to gently undulating, practically treeless and possesses an overall appearance of uniformity. Flood plains on quaternary alluvium.
Woody vegetation	Scattered occurrences of coolibah, gidgee, bauhinia, beefwood, guttapercha and whitewood.
Expected pasture composition	<i>* Denotes non-native species</i>
Preferred	Mitchell grass (bull, hoop), gulf bluegrass, silky browntop, forest bluegrass, desert bluegrass, Queensland bluegrass.
Intermediate	Native millet, golden beard grass, windmill grasses, bottlewashers, Australian wild rice, tassel bluegrass, cup grass/spring grass, pitted bluegrass.
Non-preferred	Wiregrasses, e.g. feathertop.
Annual grasses	Flinders grass, button grass, pepper grass, Annual sorghum, native couch, Australian dropseed, summer grass. Non-preferred annual species include asbestos grass.
Common forbs	Sesbania pea, onion vine/paper rose, Ipomoea/cow vine, tarvine, rhynchosia.
Suitable sown pasture	Not suitable for sown pastures.
Introduced weeds	Calotrope, mesquite, prickly acacia, parkinsonia, and rubber vine and bellyache bush in associated riparian areas.

Soil	Cracking grey and brown clays (vertisols). Commonly interspersed with alluvial soils along stream, river, and creek beds.
Description	Surface: Generally self-mulching, a thin crust may be present, minor areas of hard setting soils; Surface texture: light to medium to heavy clay; Sub-soil texture: medium to heavy clay
Features	Predominantly self-mulching and deep cracking with some hard-setting areas. Carbonate nodules may occur throughout the profile. Gilgai's can occur as both melon holes and linear gilgai.
Water availability	Moderate to high with low to moderate internal drainage depending on the sodicity at depths.
Rooting depth	Moderate to high.
Fertility	Moderate. Tendency to be marginal in Phosphorous.
Infiltration	High initially on a dry soil profile, slowing to moderate levels after 50 mm of rain as cracks close and to low levels after 75-100 mm of rain. Areas of hard setting soils will have extremely limited infiltration rates. Estimates based on low to moderate intensity storm rain. Good soaking rain or flooding required to wet the soil profile.
Salinity	Low but increasing with depth.
Sodicity	Patches of sodicity; increasing with depth, particularly in poorly drained areas.
pH	Neutral to alkaline (gravelly areas may be slightly acidic).
Utilisation	22%
Enterprise	Breeding and fattening.
Land use and management recommendations	<ul style="list-style-type: none"> • Use fire judiciously as a management tool to control woody weeds. • Maintenance of ground cover to minimise shrub invasion and wind and water (gully) erosion.
Land use limitations	<ul style="list-style-type: none"> • Areas of asbestos grass • Productivity can be limited by thickening of native timber and woody weeds (guttapercha, parkinsonism, mimosa) • No urgent or immediate conservation concerns.
Conservation features and related management	
Regional ecosystems	2.3.12, 2.3.1a, 2.3.3, 2.3.4, 2.3.43, 2.3.44a-e, 2.3.67, 2.4.1a-c, 2.9.2, 2.9.2x3, 4.3.19.
Land systems	Donors (28), Donaldson (29), Balbirini (48), Glenore (50), Georgina (55) (Perry 1964)

Coastal country



Landform

Grassland on low plains adjacent to marine plains.

Woody vegetation

Predominantly paperbark understorey with coolibah, large leaf cabbage gum, broad-leaved carbeen, figs, beefwood, guttapercha and palms.

Expected pasture composition

** Denotes non-native species*

Preferred

Golden beard grass, silky browntop, wanderrie grasses, northern rice grass, Australian wild rice, Queensland bluegrass.

Intermediate

Cane grass, beetle grass, panic grasses, marine couch, spiny mud grass.

Non-preferred

Wiregrasses.

Annual grasses

Fire grass, native couch, Australian dropseed, Flinders grass, hare's foot grass

Common forbs

Potato/tomato bushes, beach bean, marsh wort.

Suitable sown pastures

Not suitable for sown pastures.

Introduced weeds

Rubber vine, parkinsonia, prickly acacia, para grass, gradergrass and mesquite

Soil	Shallow, impervious, highly erosive in the subsoil. Redearths, slightly deeper with a range from sandy loams to light clays.
Description	Surface: Sandy, fine sandy or silty clay loams or clays, light to grey to greyish brown in the upper portion; Surface texture: sandy loam to clay; Sub-soil texture: bleached below; with a sub-soil texture that is a massive structure with hard consistence some presence of carbonate nodules and/or gypsum at shallow depths.
Features	Surface horizons can be sandy with clay underneath. Often pasture growth is limited to the sandy horizon.
Water availability	Low to moderate.
Rooting depth	Shallow to moderate.
Infiltration	Moderate initially slowing after 20 mm, significant run off expected after 35 mm. Estimates based on low to moderate intensity storm rain. Good soaking rain required to wet the soil profile.
Fertility	Low to moderate.
Salinity	Moderate to high.
Sodicity	
pH	Neutral to acid at the surface, varying from strongly alkaline to strongly acidic in the subsoil.
Utilisation	15%
Enterprise	Breeding.
Land use and management recommendations	<ul style="list-style-type: none"> • Use fire judiciously as management tool to control timber thickening. • Maintenance of ground cover to minimise shrub invasion and erosion.
Land use limitations	<ul style="list-style-type: none"> • Hard panning at shallow to moderate depths occurs in some areas. • Pasture growth is often limited by salts. • Production may be limited by weedy growth of guttapercha.
Conservation features and related management	<ul style="list-style-type: none"> • Seasonal wetland. • Important feeding sites for birds.
Regional ecosystems	1.3.5, 1.3.6a-c, 1.3.6e, 1.3.7a-b, 1.3.7f-g, 1.3.9a-b, 2.3.14, 2.3.17d, 2.3.20a, 2.3.20c, 2.3.21b-c, 2.3.59a-b, 2.3.65.
Land Systems	Carpentaria (58) (Perry 1964)

Frontage



Landform	Frontage country: channels and levees.
Woody vegetation	Open woodlands with fringing river red gum woodland. Associated species include: north-west ghost gum, bloodwoods (western, long-fruited), bauhinia, broad-leaved carbeen, guttapercha, Fringing species may include figs, paperbarks, Leichhardt's tree.
Expected pasture composition	<i>* Denotes non-native species</i>
Preferred	Black speargrass, golden beard grass, forest bluegrass, desert bluegrass, silky browntop, giant speargrass and buffel*.
Intermediate	Pitted bluegrass, curly windmill grass.
Non-preferred	Wiregrasses.
Annual grasses	Comet grass, hairy arm grass, wanderrie grasses, Australian dropseed, button grass, windmill grasses, and native sorghum. Non-preferred annual species include bunched kerosene grass and asbestos grass.
Common forbs	Sensitive plant, desert milkwort, round pod indigo, sesbania pea, nardoo, merauke hibiscus.
Suitable sown pastures	Buffel grass, shrubby stylo (e.g. Seca), Caribbean stylo (e.g. Verano).
Introduced weeds	Chinee apple, rubbervine, bellyache bush, calotrope, hyptis, grader grass, castor oil bush, parkinsonia, noogoora burr, kapok bush.

Soil	Alluvial sands or sandy loams that may grade to deep red clay soils in some areas (tenosols).
Description	Surface: Loose and/or massive and soft; Surface texture: sands or sandy loams; Sub-soil texture: largely variable clays, sands, deep sands
Features	Fine sandy soils in channels and levees, grading to the heavier soils on the banks and flooded areas.
Water availability	Moderate through to very low.
Rooting depth	Moderate to deep (in deeper sands).
Infiltration	Very poor to very high, although drainage slows at depth. In sands containing clay it can be quite low. The coarser the sands the higher the infiltration rates.
Fertility	Moderate – high.
Salinity	Low.
Sodicity	Low.
pH	Slightly acidic to neutral.
Utilisation	18%
Enterprise	Breeding and fattening.
Land use and management recommendations	<ul style="list-style-type: none"> • Pasture species that provide high diet quality are susceptible to overuse. • High grazing pressure can lead to wind erosion and scalding.
Land use limitations	<ul style="list-style-type: none"> • Productivity can be limited by high shrub densities and woody weed infestation.
Conservation features and related management	<ul style="list-style-type: none"> • Some areas of wetlands either endangered or at risk. High total grazing pressure leading to degradation along watercourses. • 1.3.9: Includes the only perennial watercourses in arid and semi-arid Queensland. Habitat for rare and threatened species including purple-crowned fairy-wren. Seasonal habitat for water birds.
Regional ecosystems	1.3.10, 1.3.11, 1.3.12, 1.3.13a-b, 1.3.14, 1.3.4a-b, 1.7.1e, 2.3.20f, 2.3.21j, 2.3.22, 2.3.24a, 2.3.26a-f, 2.3.41, 2.3.42d, 2.3.52, 2.3.54, 2.3.62a, 2.3.69a, 2.3.6b, 2.3.7a-b, 2.5.40, 2.9.4a, 2.9.4x1, 9.3.1, 9.3.11a, 9.3.13, 9.3.17, 9.3.22a, 9.3.25, 9.3.26, 9.3.27a, 9.3.3b, 9.3.5, 9.3.6a, 9.8.6.
Land systems	Cloncurry (53), Armraynald (56) (Perry 1964)

Gidgee



Landform

Alluvial deposits occurring as plains, floodplains and sediments forming undulating plains.

Woody vegetation

Low open woodland, with moderately dense woodland areas, of predominantly gidgee with scattered bloodwood, whitewood, vine tree/supplejack, cassias, and currant bush.

Expected pasture composition

** Denotes non-native species*

Preferred

Mitchell grass, gulf bluegrass, black speargrass.

Intermediate

Bottlewashers, silky browntop, soft spinifex, pitted bluegrass, golden beard grass, wanderrie grasses, windmill grasses.

Non-preferred

Wiregrasses.

Annual grasses

Button grass, Flinders grass, awnless barnyard grass, native couch.

Common forbs

Sesbania pea, low sensitive plant, native jutes, Flemings bush, climbing saltbush, ruby saltbush, gidgee burr, copperburr.

Suitable sown pastures

Buffel grass, desmanthus (> 600mm), Caatinga stylo (>750 mm).

Introduced weeds

Not much grows in or around gidgee. However, rubbervine, calotrope and bellyache bush will grow in woody areas.

Soil	Grey-brown cracking clays (vertosols). Minor areas of red/yellow earths (kandosols).
Description	Surface: generally self-mulching clays; may have some sand present on the surface as well; Surface texture: medium to heavy clays, Sub-soil texture: clay subsoil. Grey-brown medium to heavy clays throughout the profile.
Features	Varies from a uniform soil surface free of stone through to an uneven stony surface.
Water availability	Moderate to high. May be limited by sodic sub soils.
Rooting depth	Moderate to deep. May be limited by sodic sub soils.
Infiltration	High for clay, 75 mm of rain before run off occurs, based on low to moderate intensity storm rain. Moderate for red/yellow earths, 35 mm of rain before run off occurs.
Fertility	Moderate to high.
Salinity	Increasing salinity with depth in clay soils, low (red/yellow earths).
Sodicity	Increasing sodicity with depth in clay soils, low (red/yellow earths).
pH	Alkaline (grey-brown clays). Medium acid to neutral (red/yellow earths).
Utilisation	15% (native); 20% (sown).
Enterprise	Breeding.
Land use and management recommendations	<ul style="list-style-type: none"> • Mechanical clearing within regulations strongly advised. • Maintenance of ground cover to minimise shrub invasion and erosion. • Strategic burning to manage gidgee encroachment with late dry season hot fires.
Land use limitations	<ul style="list-style-type: none"> • Regrowth and high shrub densities can limit productivity. • Mass germination around 2010 will lead to reduced productivity within 10 to 15 years
Conservation features and related management	<ul style="list-style-type: none"> • Not of significant conservation value.
Regional ecosystems	1.5.6c-d, 1.9.9, 2.4.3a-b, 2.4.5, 2.5.34a-b, 2.5.38.
Land systems	Donaldson (29), Quamby (34), Percol (47), Monstraven (49), Gregory (52) (Perry 1964)

Ironbark



Landform	Plateau high plains and erosional plains. Low hills and plateaus of limestone.
Woody Vegetation	Ironbark woodlands or forests with associated ghost gum, bloodwoods (long fruited, rough-leaved) and beefwood.
Expected pasture composition	<p><i>* Denotes non-native species</i></p> <p>Preferred Black speargrass, giant speargrass, kangaroo grass, forest bluegrass, desert bluegrass, Queensland bluegrass, plume sorghum.</p> <p>Intermediate Pitted bluegrass, golden beard grass, white speargrass, red Natal grass*, silky oil grass, lovegrasses, Indian couch*, wanderrie grass</p> <p>Non-preferred Reed grass, canegrass, wiregrasses.</p> <p>Annual grasses Panic grasses, comet grass, sandstone panic, Australian dropseed, firegrass.</p> <p>Common forbs Nutgrasses, sedges, spike rushes.</p>
Suitable sown pastures	Oversow with legumes; shrubby stylo (e.g. Seca), Caribbean stylo (e.g. Verano).
Introduced weeds	Chinee apple, rubbervine, grader grass.

Soil	Sandy loam; brown, yellow and red soils.
Description	Surface: Loam; Surface texture: varies from loose to hard-setting; Sub-soil texture: light/medium clay at varying depths.
Features	Drainage is hugely variable, surface consistence varies from loose to hard-setting.
Water availability	Low to moderate. Limited except after major wetting event.
Rooting depth	Moderate to deep.
Infiltration	On deeper loam surface soils; moderate to low initially on a dry soil profile, slowing to low levels after 25-35 mm. On hard setting soils; low with water-ponding following 5mm of rain or less as the surface seals.
Fertility	Low to Moderate. Areas of marginal phosphorous.
Salinity	Low; may increase with depth when heavier textured clays are present.
Sodicity	Low; may increase with depth when heavier textured clays are present.
pH	Medium acid to neutral.
Utilisation	15%
Enterprise	Breeding.
Land use and management recommendations	<ul style="list-style-type: none"> • Use fire judiciously as a tool to control woody species. • Maintenance of ground cover to minimise shrub invasion and erosion.
Land use limitations	<ul style="list-style-type: none"> • Timber thickening can limit productivity.
Conservation features and related management	<ul style="list-style-type: none"> • Not of significant conservation concern.
Regional ecosystems	2.10.3.
Land systems	Karoon (2), Boorooman (4), Kilbogie (40) (Perry 1964)

Lancewood



Landform

Residual slopes, scarp retreats and adjacent tops of dissected plateaus and broken sandstone tablelands.

Woody vegetation

Lancewood woodland or low open woodland. Infrequently and sparsely associated with Normanton box.

Expected pasture composition

** Denotes non-native species*

Preferred

Golden beard grass, spinifex, kangaroo grass.

Intermediate

Wiregrasses, wanderrie grasses, curly windmill, bottlewashers.

Non-preferred

Annual grasses

Fire grass, annual wiregrasses (including kerosene grass)

Common forbs

Sidas, potato bush, flannel weed.

Suitable sown pastures

Not suitable for sown pastures.

Introduced weeds

Soil	Skeletal soils and shallow red earths; texture contrast soils and stony brown clays on steep slopes at the base of cliffs; often extensive rock outcropping.
Description	Surface: Variable rock stone and gravel cover; Surface texture: sandy loam to none; Sub-soil texture: weathered parent material.
Features	Extensive rock outcropping and/or extensive covers of rock, rubble, and gravel. Provides useful run-on to surrounding areas.
Water availability	Very low.
Rooting depth	Very shallow.
Infiltration	Very low. High proportion of run-off following 5 mm of rain, even under low intensity rainfall.
Fertility	Very low.
Salinity	Non-saline.
Sodicity	Non-sodic.
pH	Very acidic.
Utilisation	15%
Enterprise	Breeding.
Land use and management recommendations	<ul style="list-style-type: none"> • Sustainable harvesting of timber for fence posts and rails. • Potential groundwater recharge area. • Useful runoff areas for stock dams.
Land use limitations	<ul style="list-style-type: none"> • Generally unsuitable for grazing • Very low soil fertility and moisture storage • Steep broken slopes.
Conservation features and related management	<ul style="list-style-type: none"> • Protected area: Lawn Hill National Park.
Regional ecosystems	1.11.7, 1.12.4, 1.7.5a-b, 1.7.6, 2.1.2, 2.1.3, 2.1.4, 2.10.2x1, 2.10.5a-c, 2.10.5x1, 2.10.5x4, 2.5.29, 2.7.2a-c, 2.7.2x10, 2.7.2x6, 2.7.2x7, 2.7.2x8, 2.7.2x9, 9.10.1c, 9.10.3b, 9.11.28a-b, 9.11.30b, 9.12.37.
Land systems	Torwood(11), Hampstead (5) (Perry 1964)

Marine plains



Landform	Level saline coastal plains, mostly bare mud and salt flats or plains of saline clay meadows on the slightly elevated plains or low plateaus.										
Woody vegetation	Predominantly treeless plains or sparse woodland of coolibah and guttapercha, with mangroves in stream channels.										
Expected pasture composition	<p><i>* Denotes non-native species</i></p> <tr> <td>Preferred</td><td>Marine couch, mudgrass, northern rice grass.</td></tr> <tr> <td>Intermediate</td><td>Canegrass, slender chloris, beetle grass, spiny mudgrass.</td></tr> <tr> <td>Non-preferred</td><td></td></tr> <tr> <td>Annual grasses</td><td></td></tr> <tr> <td>Common forbs</td><td> <p>Spike rushes, fringe rush, common sedges.</p> <p>Samphire grows on saline and tidal mud flats and is eaten when stock have high salt tolerance or when fresh water is readily available.</p> </td></tr>	Preferred	Marine couch, mudgrass, northern rice grass.	Intermediate	Canegrass, slender chloris, beetle grass, spiny mudgrass.	Non-preferred		Annual grasses		Common forbs	<p>Spike rushes, fringe rush, common sedges.</p> <p>Samphire grows on saline and tidal mud flats and is eaten when stock have high salt tolerance or when fresh water is readily available.</p>
Preferred	Marine couch, mudgrass, northern rice grass.										
Intermediate	Canegrass, slender chloris, beetle grass, spiny mudgrass.										
Non-preferred											
Annual grasses											
Common forbs	<p>Spike rushes, fringe rush, common sedges.</p> <p>Samphire grows on saline and tidal mud flats and is eaten when stock have high salt tolerance or when fresh water is readily available.</p>										

| **Suitable sown pastures** | Not suitable for sown pastures. |
| **Introduced weeds** | Rubbervine, parkinsonia (more elevated areas). |

Soil	Grey and black saline crackling clays with areas of mud flats or saline soils with sandy surfaces.
Description	Surface: Loose or thin salt crust; Surface texture: clay loam or sandy or shelly clay; Sub-soil texture: silty to heavy.
Features	Sandy or shelly clay surfaces occurring on slightly elevated plains. Carbonate nodules and/or gypsum occur at shallow depths. Virtually no internal drainage. Water ponds readily.
Water availability	High water holding capacity. Availability limited by salinity and sodicity.
Rooting depth	Shallow.
Infiltration	Moderate to low.
Fertility	Moderate to high. Low Nitrogen, high Phosphorous.
Salinity	High.
Sodicity	High.
pH	Acidic sands, slightly alkaline to acidic clays.
Utilisation	25%
Enterprise	Breeding.
Land use and management recommendations	<ul style="list-style-type: none"> • Suitable for grazing native pastures. • Seasonal inundation provides wet season spelling in most years • Early dry (July) burning and overgrazing should be avoided to maintain effective ground cover at break of season.
Land use limitations	<ul style="list-style-type: none"> • Extreme salinity and regular inundation prevent any agricultural development. • As fresh water is scarce, stock can only graze for a short period of time while surface water is available following the wet season.
Conservation features and related management	<ul style="list-style-type: none"> • Permanent and seasonal wetlands. • Seasonally important habitat for water birds breeding and feeding. • Can be refuge for fauna including macropods.
Regional ecosystems	2.3.2a, 2.3.2x1, 2.9.1.
Land Systems	Carpentaria (58) (Perry 1964)

Mitchell grass



Landform	Flat to undulating plains. Often adjoins and sometimes mixed in with bluegrass browntop plains and/or flooded plains.
Woody vegetation	Predominantly treeless plains with whitewood, vine tree/supplejack and areas of gidgee and corkwood wattle and coolibah and guttapercha on the edge of flooded areas.
Expected pasture composition	<p><i>* Denotes non-native species</i></p>
Preferred	Mitchell grass, gulf bluegrass, Queensland bluegrass, buffelgrass*, forest bluegrass, desert bluegrass.
Intermediate	Cupgrass/spring grass, silky browntop, umbrella canegrass, lovegrass, native millet.
Non-preferred	Feathertop.
Annual grasses	<p>Australian dropseed, summer grass, pepper grass, Flindersgrass, native couch, button grass, annual sorghum.</p> <p>Non preferred species include asbestos grass.</p>
Common forbs	Sidas, pigweed, sensitive plants, tarvine, chain pea, annual verbine/native lucerne, glycine, rattlepod, cow vine, camel bush/cattle bush(wet areas), onion vine/paper rose, desmodium, sesbania pea, rhynchosia, tick weed, goathead, flinders poppy, speedyweed.
Suitable sown pastures	Generally not suitable for sown pastures.
Introduced weeds	Prickly acacia, parkinsonia, mesquite, potentially parthenium.

Soil	Grey-brown heavy cracking calcareous clays with uneven, self-mulching and often ashy surfaces, and with some areas of pebbly downs.
Description	Surface: Self-mulching with some crusting, ashy in areas and minor occurrences of stone; Surface texture: heavy clay; Sub-soil texture: heavy clay.
Features	Uniform colour and a self-mulching surface.
Water availability	Moderate to high.
Rooting depth	Deep to moderate.
Infiltration	High initially on a dry soil profile, slowing to moderate levels after 75 mm of rain as cracks close and to low levels after 100 mm of rain. Increasing run-off following 100 mm of rain. Estimates based on low to moderate intensity storm rain.
Fertility	Moderate.
Salinity	Non-saline at surface. In some areas increasing to high to very high values with depth.
Sodicity	Non-sodic at surface; subsoils can be sodic.
pH	Alkaline to very alkaline.
Utilisation	22%
Enterprise	Breeding and fattening.
Land use and management recommendations	<ul style="list-style-type: none"> Use fire judiciously as management tool to control woody weeds and feathertop.
Land use limitations	<ul style="list-style-type: none"> Heavier claysoils require 75-100 mm of rain for Mitchell grasses to grow. Regrowth and high densities of shrubs such as prickly acacia and guttapercha can limit productivity.
Conservation features and related management	<ul style="list-style-type: none"> Protected areas include Camooweal Caves and Lawn Hill National Park.
Regional ecosystems	1.11.13, 1.5.1, 1.5.2a-c, 1.5.3, 1.5.4a, 1.5.4c-d, 1.5.7, 1.9.1, 2.4.2a-b, 2.5.2, 2.5.32, 2.9.1.
Land systems	Julia(27), Monstraven (49), Gregory(52), Wonardo (30) (Perry 1964)

Open red country



Landform	Outwash plains, erosional plains. Sometimes on gravelly alluvium or limestone ridges.
Woody vegetation	Open woodland including snappy gum, western bloodwood, Cloncurry box, silver-leaved box, gidgee and beefwood. Wattles, wait-a-while, cassia and currant bush shrubs are commonly found.
Expected pasture composition	<i>* Denotes non-native species</i>
Preferred	Kangaroo grass, forest bluegrass, desert bluegrass, black speargrass, Cloncurry buffel grass*.
Intermediate	Bottlewashers grasses, cotton panic, whitegrass, five-minute grass, soft spinifex, silky browntop, golden beard grass, silky oil grass.
Non-preferred	Wiregrasses.
Annual grasses	Button grass, wanderrie grasses, native couch, Australian dropseed, small burr grass, comb chloris, rare panic.
Common forbs	Foxtails, common bonamia, tickweed, tropical speedwell, sidas, pigweed, soft roly poly, gidgee burrs.
Suitable sown pastures	Buffel grass, shrubby stylos (e.g. Seca), Caribbean stylos (e.g. Verano).
Introduced weeds	Calotrope, mesquite, parkinsonia, bellyache bush, kapok bush.

Soil	A variety of soils, the best being deep loamy red earths. Patches of red clays, texture contrast soils and some skeletal soils.
Description	Surface: Loamy with surface crusting and hard-setting; Surface texture: silty loam; Sub-soil texture: light to medium clays.
Features	Massive surface with soft consistency. Poor structure limits water infiltration during heavier rain. Contains small deposits of shallow skeletal soils. Impermeable surface horizon and hard sub soils.
Water availability	Low to moderate. Water holding capacity and internal drainage low to moderate.
Rooting depth	Low to moderate.
Infiltration	Low during heavier rainfall and moderate during lighter rainfall.
Fertility	Low. Particularly phosphorous.
Salinity	Low.
Sodicity	Low.
pH	Neutral to acidic, possibly changing at depth.
Utilisation	15%
Enterprise	Breeding.
Land use and management recommendations	<ul style="list-style-type: none"> • Use fire judiciously as management tool to control wattle, turpentine, and timber thickening. • Maintenance of ground cover to minimise shrub invasion and erosion.
Land use limitations	<ul style="list-style-type: none"> • Areas of scalding due to overuse. • Wattle thickening can limit productivity.
Conservation features and related management	<ul style="list-style-type: none"> • Includes some areas of Lawn Hill National Park. • Changed fire regimes and heavy grazing can lead to changes in the floristics of the native vegetation.
Regional ecosystems	1.10.2, 1.10.3, 1.10.4a-b, 1.10.6, 1.11.2, 1.11.2a, 1.11.2h-j, 1.11.3a-b, 1.12.1, 1.12.1x5, 1.12.2, 1.5.15, 1.5.16, 1.5.17, 1.5.18, 1.5.19, 1.6.1, 1.9.5b, 2.10.1a, 2.10.4a-b, 2.10.4x3, 2.10.6, 2.10.6x2, 2.11.1a, 2.11.1c, 2.11.1x1, 2.12.1a-b, 2.5.10a-c, 2.5.23a-b, 2.5.35, 2.7.3, 2.7.3x1, 4.5.5b, 4.7.2x1, 4.7.7a-b.
Land systems	Quamby (34), Percol (47) (Perry 1964)

Rough spinifex hills



Landform	Rugged mountains, rocky plateaus and high plains, and hilly country.
Woody vegetation	Sparse low-woodland of snappy gum with scattered Cloncurrybox, western bloodwood, winged nut tree, turpentine, wattles and cassias. <i>* Denotes non-native species</i>
Expected pasture composition	
Preferred	Soft spinifex, Cloncurry buffel grass*.
Intermediate	Bottlewashers, wanderrie grasses, hard spinifex, five-minute grass.
Non-preferred	Wiregrasses.
Annual grasses	Native couch, small burr grass, Australian dropseed, fire grass, slender wanderrie grass.
Common forbs	Gidgee burrs, foxtails, sidas, red spinach.
Suitable sown pastures	Not suitable for sown pastures.
Introduced weeds	Kapok bush.

Soil	Skeletal and rock outcrops poorly drained deeper soils along drainagelines.
Description	Surface: Massive with varying stone cover; Surface texture: sandy loam to sandy clay loam; Sub-soil texture: clay
Features	Deeper soils occur along drainage lines. Soils drain poorly at depth. Surface soil tends to seal. Generally, shallow soils less than 30cm are frequently stony and occur on steeper slopes.
Water availability	Very low to low.
Rooting depth	Low.
Infiltration	High on the steeper country until surface wets up after 10-15 mm of rain. On the deeper soils along drainage lines, light rain will be required to allow water to infiltrate down to the deeper clays once profile is wet, little through drainage is likely to occur, rest will run off.
Fertility	Low.
Salinity	Low, unknown at depth along the drainage lines.
Sodicity	Low, unknown at depth along the drainage lines.
pH	Neutral to acidic.
Utilisation	15%
Enterprise	Breeding.
Land use and management recommendations	<ul style="list-style-type: none"> • Maintenance of perennial pastures is required to allow infiltration in the deeper soils. • Maintenance of ground cover to minimise shrub invasion and erosion. • Mosaic burning for wildfire control, turpentine management and to improve access and grazing value of spinifex.
Land use limitations	<ul style="list-style-type: none"> • Steepness of slope may limit available grazing areas. • Steepness of slope and shallow stony soils limit cultivation opportunities. • Turpentine thickening can limit productivity.
Conservation features and related management	<ul style="list-style-type: none"> • Historic mining has potential to impact water quality.
Regional ecosystems	1.11.6, 1.11.8, 1.11.9, 1.12.3a, 1.7.1a, 1.7.7a, 1.9.10, 1.9.11a, 1.9.11c, 1.9.12, 1.9.13, 1.9.14, 1.9.4b-c, 2.3.20b, 2.3.37, 2.5.4, 2.5.9, 4.9.12x4a.
Land systems	Kuridala (18), Argylla (8) Merlin (13) (Perry 1964)

Sandy forest country



Landform

Timbered sandy plains.

Woody vegetation

Low, moderately dense, woodland of bauhinia, beefwood, dead finish, arid peach, paperbarks, and long-fruited bloodwoods occurring in stands. Scattered scrubs include currant bush, wait-a while and mimosa bush*. Some areas of wattle.

Expected pasture composition

** Denotes non-native species*

Pastures often dominated by Aristida and the annual fire grass species.

Preferred

Black speargrass, kangaroo grass, gulf bluegrass, forest bluegrass, desert bluegrass.

Intermediate

Golden beard grass, plume sorghum, lovegrasses, wanderrie grasses, cotton panic.

Non-preferred

Wiregrasses (including kerosene grass).

Annual grasses

Fire grass, comb finger grass, rare panic pigeon grass, comet grass, annual sorghum, long-awn wanderrie grass.

Common forbs

Bluebush, potato bush, native jute, hibiscus.

Suitable sown pastures

Buffel grass, shrubby stylo (e.g. Seca), Caribbean stylo (e.g. Verano).

Introduced weeds

Chinee apple, grader grass.

Soil	Deep sands, mainly brown soils of light texture.
Description	Surface: Loose; Surface texture: sandy; Subsoil texture: sand to light clay.
Features	Surface runoff is very low. Subsoils are soft to slightly hard.
Water availability	Low
Rooting depth	Moderate to deep.
Infiltration	High; medium or very rapid internal drainage.
Fertility	Low. Particularly nitrogen and available phosphorus.
Salinity	Non-saline.
Sodicity	Non-sodic.
pH	Neutral to strongly acid in the surface.
Utilisation	15%.
Enterprise	Breeding.
Land use and management recommendations	<ul style="list-style-type: none"> • Use fire judiciously as management tool to control wattle and timber thickening. • Maintenance of ground cover to minimise shrub invasion and wind erosion.
Land use limitations	<ul style="list-style-type: none"> • Suitably placed and designed road, fence line and/or firebreak location are necessary to prevent extreme erosion. • Regrowth and high shrub densities can limit productivity.
Conservation features and related management	<ul style="list-style-type: none"> • Provincial refuge for some flora and fauna.
Regional ecosystems	1.11.4, 2.3.20e, 2.3.20g, 2.5.11b-c, 2.5.12a-d, 2.5.17a-b, 2.5.1a-d, 2.5.30, 2.5.36, 2.5.37b, 2.5.8x70, 2.7.3x2, 2.7.3x3a-b, 2.7.3x4, 2.7.3x5, 2.7.3x6, 2.7.4x1.
Land Systems	Murgulla (24), Bylong (44), Claraville (43), Strathmore (23) (Perry 1964)

Silver-leaved box



Landform

Timbered to lightly timbered inland plains.

Woody vegetation

Silver-leaved box low woodlands with occasional whitewood, beefwood, and western bloodwood. Paperbark, winged nut tree and gutta-percha occur in higher rainfall areas. Sparse shrub cover may include currant bush, wait-a-while and wattles.

Expected pasture composition

** Denotes non-native species*

Preferred

Black speargrass, kangaroo grass, forest bluegrass, desert bluegrass, Gulf bluegrass (on heavier soils)

Intermediate

Bottlewashers, cotton panic, five-minute grass, silky browntop, golden beard grass, silky oil grass, soft spinifex.

Non-preferred

Wiregrasses.

Annual grasses

Button grass, slender wanderrie grass, long-awn wanderrie grass, native couch, Australian dropseed, small burr grass, comb chloris, fire grass.

Common forbs

Tickweed, sidas, flannel weed, common bonamia, tropical speedwell, soft roly poly.

Suitable sown pastures

Buffel grass, shrubby stylo (e.g. Seca), Caribbean stylo (e.g. Verano).

Introduced weeds

Calotrope.

Soil	Red and yellow earths.
Description	Surface: massive. (Generally hard settling with some areas of softer). Areas of surface ironstone occur. Surface texture: sand, sandy loam or sandy clay loam; Subsoil texture: ranges from sandy clay to a medium clay.
Features	Subsoil structure is hard to very hard. Variable amounts of ironstone nodules in profile of some soils and decreasing with depth.
Water availability	Moderate.
Rooting depth	Moderate, limited by hard subsoils.
Infiltration	Ranges dramatically depending on soil surface characteristics. Generally moderately drained, some soils poorly drained and prone to periodic waterlogging. The sandier the soil the higher the infiltration rates. Areas of ironstone are generally less permeable.
Fertility	Very low to low.
Salinity	Very low.
Sodicity	Non-sodic.
pH	Neutral to medium acid at the surface. Some sub-soils are alkaline.
Utilisation	18%
Enterprise	Breeding.
Land use and management recommendations	<ul style="list-style-type: none"> • Use fire judiciously as management tool to control wattles and timber thickening. • Maintenance of ground cover to minimize shrub invasion and erosion.
Land use limitations	<ul style="list-style-type: none"> • Areas of scalding due to overuse. • Hard to very hard subsoils. • Regrowth and high shrub densities can limit productivity.
Conservation features and related management	<ul style="list-style-type: none"> • Periodic wildfires can lead to changes in woody vegetation and pasture composition.
Regional ecosystems	1.3.15, 1.5.10a-b, 1.5.11, 1.5.13, 1.5.14a-b, 2.3.32, 2.5.31, 2.5.33a-d, 2.7.5a-b, 2.7.5x1, 2.7.5x50b.
Land systems	Korong (46), Manrika (20) (Perry 1964)

Soft spinifex country



Landform

Dissected low plateaux and high plains and ridges. Small areas occur on hills and steeper slopes.

Woody vegetation

Silver leaf box or snappy gum low woodlands. Other low woodland species that occur include western bloodwood, whitewood, beefwood and paperbarks. Shrubs may include turpentine, wattles, currant bush and cassias.

Expected pasture composition

** Denotes non-native species*

Preferred

Soft spinifex, kangaroo grass, Cloncurry buffel grass*, black speargrass.

Intermediate

Silky oil grass, golden beard grass, bottlewashers.

Non-preferred

Wiregrasses.

Annual grasses

Button grass, Australian dropseed, native couch, small burr grass, slender wanderrie grass, long-awn wanderrie grass.

Common forbs

Rattlepods, tickweed, common bonamia, tropical speedwell, Birdsville indigo, sidas.

Suitable sown pastures

Shrubby stylos (e.g. Seca), Caribbean stylos (e.g. Verano).

Introduced weeds

Grader grass, calotrope.

Soil	Skeletal soils and sands and deeper red and yellow earths.
Description	Surface: Loose, soft and massive; Surface texture: <i>sand</i> , sandy loam or sandy clay loam; Sub-soil texture: light clay to clay, where present.
Features	Soils frequently uneven and often shallow to rock. Clay subsoils are hard where present.
Water availability	Low to moderate.
Rooting depth	Low to moderate.
Infiltration	Low to moderate.
Fertility	Low to moderate. Low in available phosphorus.
Salinity	Very low.
Sodicity	Very low.
pH	Neutral to medium acid.
Utilisation	15%
Enterprise	Breeding.
Land use and management recommendations	<ul style="list-style-type: none"> • Use fire judiciously as management tool to control wattle and timber thickening. Fire can be used to improve access to palatable spinifex, to encourage spinifex seeds to germinate. • Maintenance of ground cover to minimise shrub invasion and erosion.
Land use limitations	<ul style="list-style-type: none"> • Scalded areas occur due to overuse. • Regrowth and high shrub densities can limit productivity.
Conservation features and related management	<ul style="list-style-type: none"> • Periodic wildfires can lead to changes in woody vegetation and pasture composition.
Regional ecosystems	1.11.10a-b, 1.11.11, 1.11.12, 1.12.3b-c, 1.12.6, 1.12.7, 1.5.12, 1.7.2a, 1.7.3, 1.7.4, 1.7.7b, 1.9.11b, 1.9.11b, 2.10.1b, 2.5.11a, 2.5.28a-b.
Land systems	Punchbowl (12), Cowan (14) (Perry 1964)