Burdekin Region
GLM Land Types

Black basalt	BD01
Blackwood scrubs on massive soils	BD02
Blackwood scrubs on structured clays	BD03
Box and napunyah	BD04
Box country	BD05
Brigalow / gidgee scrubs	BD06
Brown basalt	BD07
Clayey alluvials	BD08
Downs	BD09
Goldfields country – black soils	BD10
Goldfields country – red soils	BD11
Lancewood-bendee-rosewood	BD12
Loamy alluvials	BD13
Narrow-leaved ironbark on deeper soils	BD14
Narrow-leaved ironbark on shallower soils	BD15
Ranges	BD16
Red basalt	BD17
Silver-leaved ironbark	BD18
Softwood scrub	BD19
Yellowjacket with other eucalypts	BD20

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Burdekin Region Plant Index

Common name	Scientific name	Page
acacia	*Acacia* spp.	BD19
Angleton bluegrass*	*Dichanthium aristatum* cv. Floren	BD01, BD06, BD08, BD09, BD10, BD18
annual lovegrasses	*Eragrostis* spp.	BD07, BD17
Australian dropseed	*Sporobolus australasicus*	
Bambatsi panic*	*Panicum coloratum*	BD01, BD06, BD08, BD09, BD18
barbwire grass	*Cymbopogon refractus*	BD04, BD14, BD15, BD18
Bathurst burr*	*Xanthium spinosum*	BD01
bauhinia	*Lysiphyllum* spp.	BD02, BD03, BD06, BD08, BD19
bellyache bush*	*Jatropha gossypiifolia*	BD05, BD08, BD10, BD11, BD13, BD19
bendee	*Acacia catenulata*	BD12
black speargrass	*Heteropogon contortus*	BD01, BD05, BD07, BD10, BD11, BD13, BD14, BD15, BD16, BD17, BD18, BD20
black tea tree	*Melaleuca bracteata*	BD01
blackbutt	*Eucalyptus cambageana*	BD02, BD03, BD06, BD08
blackwood	*Acacia argyrodendron*	BD02, BD03, BD08, BD09
blady grass	*Imperata cylindrica*	BD16
bloodwood/s	*Corymbia* spp.	BD01, BD05, BD07, BD13, BD14, BD17, BD18, BD20
blue gum	*Eucalyptus tereticornis*	BD13
bottletree	*Brachychiton rupestris*	BD19
bottlewasher grass/es	*Enneapogon* spp.	BD04, BD05, BD12, BD15, BD18, BD20
box	*Eucalyptus persistens*	BD14, BD18
brigalow	*Acacia harpophylla*	BD06, BD08, BD09
brigalow grass	*Paspalidium caespitosum*	BD02, BD03, BD06, BD12, BD19
brown sorghum	*Sorghum nitidum*	BD07, BD17
buck spinifex	*Triodia mitchellii*	BD16, BD20

Common name	Scientific name	Page
buffel grass*	*Pennisetum ciliare (*formerly *Cenchrus ciliaris)*	BD03, BD05, BD06, BD07, BD08, BD10, BD11, BD13, BD14, BD17, BD18, BD19
bull Mitchell grass	*Astrebla squarrosa*	BD01, BD02, BD03, BD06, BD08, BD09
bulloak	*Hakea chordophylla*	BD14
butterfly bush	*Petalostylis labicheoides*	BD12
butterfly pea*	*Clitoria ternatea*	BD01, BD06, BD08, BD09, BD10, BD13, BD18, BD19
button grass	*Dactyloctenium radulans*	BD01, BD02, BD03, BD05, BD06, BD07, BD08, BD09, BD10, BD11, BD13, BD14, BD15, BD17, BD18
Caatinga stylo/s*	*Stylosanthes seabrana*	BD01, BD03, BD06, BD07, BD08, BD09, BD10, BD11, BD13, BD17. BD19
calotrope*	*Calotropis procera*	BD01, BD07, BD08, BD10, BD11, BD13, BD15, BD17
canegrasses	*Ophiuros exaltatus*	BD08, BD13
Captain Cook bush*	*Cascabela thevetia*	BD01, BD07, BD08, BD10, BD13, BD17
Caribbean stylo/s*	*Stylosanthes hamata* (cvv. Verano, Amigo)	BD05, BD10, BD11, BD13, BD14, BD15, BD16, BD17, BD18, BD19
castor oil plant*	*Ricinus communis*	BD13
chinee apple*	*Ziziphus mauritiana*	BD01, BD07, BD08, BD10, BD11, BD13, BD17, BD19
citronella grass	*Cymbopogon bombycinus*	BD04
comet grass	*Perotis rara*	BD12, BD18
coolibah	*Eucalyptus coolabah*	BD08, BD09
corkwood wattle	*Acacia bidwillii*	BD10, BD11
cotton panic	*Digitaria brownii*	BD05, BD11, BD12, BD13, BD20
creeping bluegrass*	*Bothriochloa insculpta*	BD01, BD06, BD07, BD10, BD11, BD13, BD14, BD17, BD18, BD19
croton	*Croton insularis*	BD19
Crow's ash	*Flindersia australis*	BD19
curly bluegrass	*Dichanthium fecundum*	BD01, BD03, BD05, BD06, BD07, BD08, BD09, BD10, BD11, BD17
curly Mitchell grass	*Astrebla lappacea*	BD01, BD06, BD08, BD09
curly windmill grass	*Enteropogon acicularis*	BD05, BD15
currant bush	*Carissa ovata*	BD02, BD03, BD05, BD06, BD11, BD14, BD15, BD18, BD19

Common name	Scientific name	Page
dark wiregrass	*Aristida calycina*	BD07, BD10, BD12, BD17, BD18, BD20
Darwin woollybutt	*Eucalyptus miniata*	BD20
delicate lovegrass	*Eragrostis tenellula*	BD07, BD17
desert bluegrass	*Bothriochloa ewartiana*	BD02, BD03, BD04, BD05, BD07, BD08, BD10, BD11, BD13, BD14, BD15, BD17, BD18
desert oak	*Acacia coriacea*	BD18
Desmanthus*	*Desmanthus virgatus*	BD01, BD03, BD06, BD08, BD09, BD10
drooping lovegrass	*Eragrostis leptocarpa*	BD07, BD17
Dropseed *see also* Australian dropseed	*Sporobolus australasicus*	BD02
emu apple	*Owenia acidula*	BD12
fairy grass	*Sporobolus caroli*	BD02, BD03, BD05, BD07, BD08, BD09, BD10, BD11, BD13, BD14, BD15, BD16, BD17, BD18
false sandalwood	*Eremophila mitchellii*	BD02, BD03, BD04, BD05, BD06, BD08, BD10, BD13, BD16, BD18
feathertop wiregrass	*Aristida latifolia*	BD01, BD03, BD06, BD09, BD11, BD18
fire grass	*Schizachyrium fragile*	BD20
five-minute grass	*Tripogon loliiformis*	BD04, BD05, BD14, BD15, BD18, BD20
flannel weeds	*Sida cordifolia*	BD05, BD12, BD15, BD18, BD20
Flinders grass	*Iseilema* spp.	BD01, BD02, BD03, BD06, BD08, BD09, BD10
forest bluegrass	*Bothriochloa bladhii*	BD11, BD14, BD15, BD18
forest red gum *see also* blue gum	*Eucalyptus tereticornis*	BD10, BD11
Gatton panic*	*Panicum maximum*	BD13
ghost gum	*Corymbia dallachiana*	BD05, BD07, BD10, BD13, BD14, BD17
giant rat's tail grass*	*Sporobolus pyramidalis*	BD01, BD07, BD13, BD17
giant speargrass	*Heteropogon triticeus*	BD07, BD13, BD16, BD17, BD20
gidgee	*Acacia cambagei*	BD02, BD06, BD08, BD09
gidgee burr	*Sclerolaena* species	BD02, BD03
golden beard grass	*Chrysopogon fallax*	BD05, BD07, BD08, BD11, BD13, BD14, BD15, BD16, BD18, BD20

Common name	Scientific name	Page
grader grass*	*Themeda quadrivalvis*	BD01, BD07, BD08, BD17
green couch*	*Cynodon dactylon*	BD08, BD13
green panic*	*Megathyrsus maximus* cvv. Petrie	BD19
grevilleas	*Grevillea* spp.	BD17, BD20
gum-topped bloodwood	*Corymbia* sp.	BD10, BD11
hairy panic	*Panicum effusum*	BD05, BD11, BD12, BD14, BD15, BD18, BD20
harrisia cactus*	*Harrisia martinii*	BD02, BD03, BD06, BD08, BD10
heartleaf poison bush	*Gastrolobium grandiflorum*	BD20
heath myrtle	*Calytrix* sp.	BD14
holly bush	*Alectryon diversifolius*	BD19
hoop Mitchell grass	*Astrebla elymoides*	BD01, BD08, BD09
hopbush	*Dodonaea* sp.	BD15
Indian couch*	*Bothriochloa pertusa*	BD05, BD07, BD10, BD11, BD14, BD16, BD17
ironwood	*Acacia excelsa*	BD12
jack bean*	*Canavalia rosea*	BD19
jericho wiregrass	*Aristida jerichoensis*	BD20
kangaroo grass	*Themeda triandra*	BD04, BD05, BD07, BD10, BD11, BD12, BD13, BD14, BD15, BD16, BD17, BD18, BD20
kangaroo oats	*Themeda avenacea*	BD12
kerosene grass	*Aristida contorta*	BD20
king bluegrass	*Dichanthium queenslandicum*	BD09
lancewood	*Acacia shirleyi*	BD12, BD14, BD16
lantana*	*Lantana camara*	BD11, BD15, BD16, BD17, BD19
leafy nineawn	*Enneapogon polyphyllus*	BD13
Leichhardt bean	*Cassia brewsteri*	BD05
lemon-scented gum *see also* spotted gum	*Corymbia citriodora*	BD14
leucaena*	*Leucaena leucocephala*	BD01, BD06, BD08, BD09, BD19

Common name	Scientific name	Page
liverseed grass*	*Urochloa panicoides*	BD01, BD07, BD13, BD15, BD17
lolly bush	*Clerodendrum floribundum*	BD19
long-fruited bloodwood	*Corymbia clarksoniana*	BD13
lovegrass/es	*Eragrostis* spp.	BD02, BD03, BD06, BD07, BD12, BD14, BD15, BD16, BD17, BD18, BD19, BD20
many-headed wiregrass	*Aristida caput-medusae*	BD12
Mexican poppy*	*Argemone ochroleuca*	BD08, BD13
mimosa*	*Acacia farnesiana*	BD06, BD09
molly box	*Eucalyptus persistens*	BD04
Moreton Bay ash	*Corymbia tessellaris*	BD13
mother-of-millions*	*Bryophyllum delagoense*	BD03, BD05, BD06, BD08, BD09, BD10
mountain coolibah	*Eucalyptus orgadophila*	BD01, BD07, BD18
mulga fern	*Cheilanthes sieberi*	BD12, BD15
napunyah	*Eucalyptus thozetiana*	BD04, BD12
narrow-leaved ironbark	*Eucalyptus crebra*	BD07, BD10, BD11, BD12, BD13, BD14, BD15, BD16, BD17, BD18
native couch *see also* spider couch	*Brachyachne convergens*	BD02, BD03, BD06, BD08, BD09
native millet	*Panicum decompositum*	BD06, BD08, BD09, BD18
Noogoora burr*	*Xanthium occidentale*	BD01, BD08
northern canegrass	*Mnesithea rottboellioides*	BD01
paperbark tea tree	*Melaleuca* spp.	BD14
parkinsonia*	*Parkinsonia aculeata*	BD01, BD02, BD03, BD05, BD06, BD08, BD09, BD10, BD13, BD18
parthenium*	*Parthenium hysterophorus*	BD01, BD03, BD06, BD07, BD08, BD09, BD10, BD13, BD17, BD18, BD19
pigweed	*Portulaca oleracea*	BD02, BD18
pitted bluegrass	*Bothriochloa decipiens*	BD07, BD13, BD14, BD15, BD17
plume sorghum	*Sarga plumosum*	BD07, BD17, BD20
poison peach	*Trema tomentosa*	BD16

Common name	Scientific name	Page
poplar box	*Eucalyptus populnea*	BD05, BD13
poplar gum	*Eucalyptus platyphylla*	BD14
poverty grass	*Eremochloa bimaculata*	BD12, BD20
prickly acacia*	*Acacia nilotica*	BD01, BD03, BD08, BD09, BD10, BD18
prickly mimosa bush*	*Acacia farnesiana*	BD08, BD10
prickly pine	*Bursaria incana*	BD18
purple lovegrass	*Eragrostis lacunaria*	BD05
purpletop Rhodes*	*Chloris inflata*	BD02
Queensland bluegrass	*Dichanthium sericeum*	BD01, BD06, BD08, BD09, BD10, BD18
quinine *see also* quinine bush and quinine tree	*Petalostigma pubescens*	BD05, BD14, BD15, BD18, BD20
quinine bush *see also* quinine and quinine tree	*Petalostigma pubescens*	BD16
quinine tree *see also* quinine bush and quinine	*Petalostigma pubescens*	BD05
rat's tail grass/es	*Sporobolus* spp.	BD16, BD20
ray grass	*Spyridium phlebophyllum*	BD02
red ash	*Alphitonia excelsa*	BD14, BD15
red Natal grass*	*Melinis repens*	BD11, BD14, BD18
Reid river box	*Eucalyptus brownii*	BD02, BD03, BD05, BD06, BD08, BD09, BD10, BD11, BD13, BD15
Rhodes grass*	*Chloris gayana*	BD17, BD19
rice grass	*Leersia hexandra*	BD02
rosewood	*Acacia rhodoxylon*	BD12, BD14, BD15
rough-leaved bloodwood	*Corymbia setosa*	BD20
rubbervine*	*Cryptostegia grandiflora*	BD01, BD03, BD05, BD06, BD07, BD08, BD09, BD10, BD11, BD13, BD15, BD17, BD19
ruby saltbush	*Enchylaena tomentosa*	BD02
sabi grass*	*Urochloa mosambicensis*	
scrub leopardwood	*Flindersia dissosperma*	BD05

Common name	Scientific name	Page
sheda grass*	*Dichanthium annulatum*	BD01, BD08
Shrubby stylo*	*Stylosanthes scabra* cvv. Seca, Siran	BD05, BD07, BD11, BD13, BD14, BD15, BD16, BD17, BD18, BD19, BD20
Siam weed*	*Chromolaena odorata*	BD13
silky browntop	*Eulalia aurea*	BD01, BD03, BD06, BD08, BD09
silky oil grass	*Cymbopogon bombycinus*	BD12, BD16, BD20
silky umbrella grass	*Digitaria ammophila*	BD20
silver-leaved ironbark	*Eucalyptus melanophloia*	BD05, BD07, BD14, BD15, BD18
silver-leaved ironbark	*Eucalyptus shirelyi*	BD16
small burr grass	*Tragus australianus*	BD02, BD04, BD05, BD12, BD13, BD14, BD15, BD18, BD20
soap bush *see also* soap tree	*Alphitonia excelsa*	BD12
soap tree *see also* soap bush	*Alphitonia excelsa*	BD20
soft lovegrass	*Eragrostis pilosa*	BD07, BD17
soft roly poly	*Salsola kali*	BD02, BD03
soft spinifex	*Triodia pungens*	BD04, BD20
spider couch	*Brachyachne convergens*	
spotted gum	*Corymbia citriodora*	
spinifex	*Triodia* spp.	BD12, BD14
stinkgrass	*Eragrostis cilianensis*	BD07, BD17
summer grass/es	*Digitaria* spp.	BD01, BD12, BD14, BD15
tableland couch	*Calyptochloa gracillima*	BD12
tall chloris	*Chloris ventricosa*	BD05
tall cup grass	*Eriochloa crebra*	BD01, BD08
turkey bush	*Eremophila* spp.	BD12, BD15
turpentine	*Acacia lysiphloia*	BD04
tussocky sporobolus	*Sporobolus diandrus*	BD01, BD08

Common name	Scientific name	Page
urochloa* *see also* sabi grass	*Urochloa mosambicensis*	BD01, BD03, BD05, BD06, BD07, BD08, BD10, BD11, BD13, BD14, BD17, BD19
wanderrie grass	*Eriachne* spp.	BD15, BD16, BD18, BD20
wattles	*Acacia* spp.	BD04, BD12, BD14, BD15, BD16, BD18, BD20
weeping lovegrass	*Eragrostis parviflora*	BD07, BD17
white speargrass	*Aristida leptopoda*	BD01, BD09, BD18
whitewood	*Atalaya hemiglauca*	BD02, BD03, BD06
wild tobacco tree*	*Solanum mauritianum*	BD16
wilga	*Geijera parviflora*	BD06, BD19
windmill grasses	*Enteropogon* spp.	BD02, BD03, BD06, BD14
winged chloris	*Oxychloris scariosa*	BD02, BD02, BD03, BD06
wiregrass/es	*Aristida* spp.	BD02, BD03, BD04, BD05, BD08, BD13, BD14, BD15, BD16, BD20
yabila grass	*Panicum queenslandicum*	BD06, BD09
yellowjacket	*Eucalyptus similis, Corymbia peltata*	BD20
yellowwood	*Terminalia oblongata*	BD02, BD03, BD06
zamia palm	*Cycas media*	BD16

* Denotes non-native species

Black basalt

Landform	Level to gently undulating plains.
Woody vegetation	Treeless grass plains with scattered black tea tree scrub, or open mountain coolibah or bloodwood woodlands. Generally understorey is absent.
Expected pasture composition	** Denotes non-native "Expected Pasture Composition" species.*
Preferred	Queensland bluegrass, curly bluegrass, black speargrass, curly and hoop Mitchell grass, tall cup grass.
Intermediate	Silky browntop, bull Mitchell grass, Angleton bluegrass*.
Non-preferred	Feathertop wiregrass, white speargrass, northern canegrass, tussocky sporobolus, sheda grass*.
Annuals	Liverseed grass*, Flinders grass, button grass, summer grasses.
Suitable sown pastures	Creeping bluegrass, Bambatsi panic, Angleton bluegrass, urochloa, leucaena, Caatinga stylo, butterfly pea, Desmanthus.
Introduced weeds	Rubbervine, parkinsonia, parthenium, prickly acacia, giant rat's tail grass, calotrope, chinee apple, Captain Cook bush, grader grass, noogoora burr, Bathurst burr.
Soil	Self-mulching black cracking clay (vertosol), with variable surface stone cover and carbonate concretions in subsoils.
Description	***Surface*:** Self-mulching; ***Surface texture*:** medium to heavy clay; ***Subsoil texture*:** medium to heavy clay.
Water availability	High
Fertility	High
Salinity	Moderately saline in subsoils.
Sodicity	Non-sodic

pH

Moderately alkaline (pH 8.3) at surface, increasing alkalinity 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 564 – 739 mm				
Pasture type	Median tree cover (TBA m^2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	3340 - 3860	30%	2.5 – 2.9
	8 TBA 20 FPC	2070 - 2390	30%	4.1 – 4.7

Enterprise

Finishing

Land use and management recommendations

- When mixed with other less fertile land types in a paddock, black basalt areas are at risk of overgrazing. Monitor land condition and adjust management to reduce grazing pressure if necessary.
- When in poor condition, can be rehabilitated or converted to sown pastures.
- Suitable for cropping in stone-free areas that have access to irrigation.
- Rotational wet seasons spelling to maintain perennial pasture composition.
- Heavy grazing encourages germination of introduced weeds, particularly parthenium.
- Maintain at least 50% ground cover at end of dry season to maximise infiltration and reduce soil erosion.

Land use limitations

- Flooding and waterlogging.
- Restricted access in wet conditions.
- May be heavily grazed by feral deer.
- Weed invasion (parthenium).
- Establishment problems with improved pastures due to crusting / cracking or coarse self-mulching surface.
- Limited soil erosion hazard. Prone to rill and gully erosion along tracks and fence lines and on sloping lands.

Conservation features and related management

- Extensively thinned, cleared or cultivated in many areas.
- Springs associated with these communities are significant for local fauna and may support endemic flora.
- Discharge areas may have associated salinity risk.
- These areas (including springs) may be subjected to high total grazing pressure.
- Subject to invasive weed species such as parthenium, rubbervine, grader grass and mimosa.

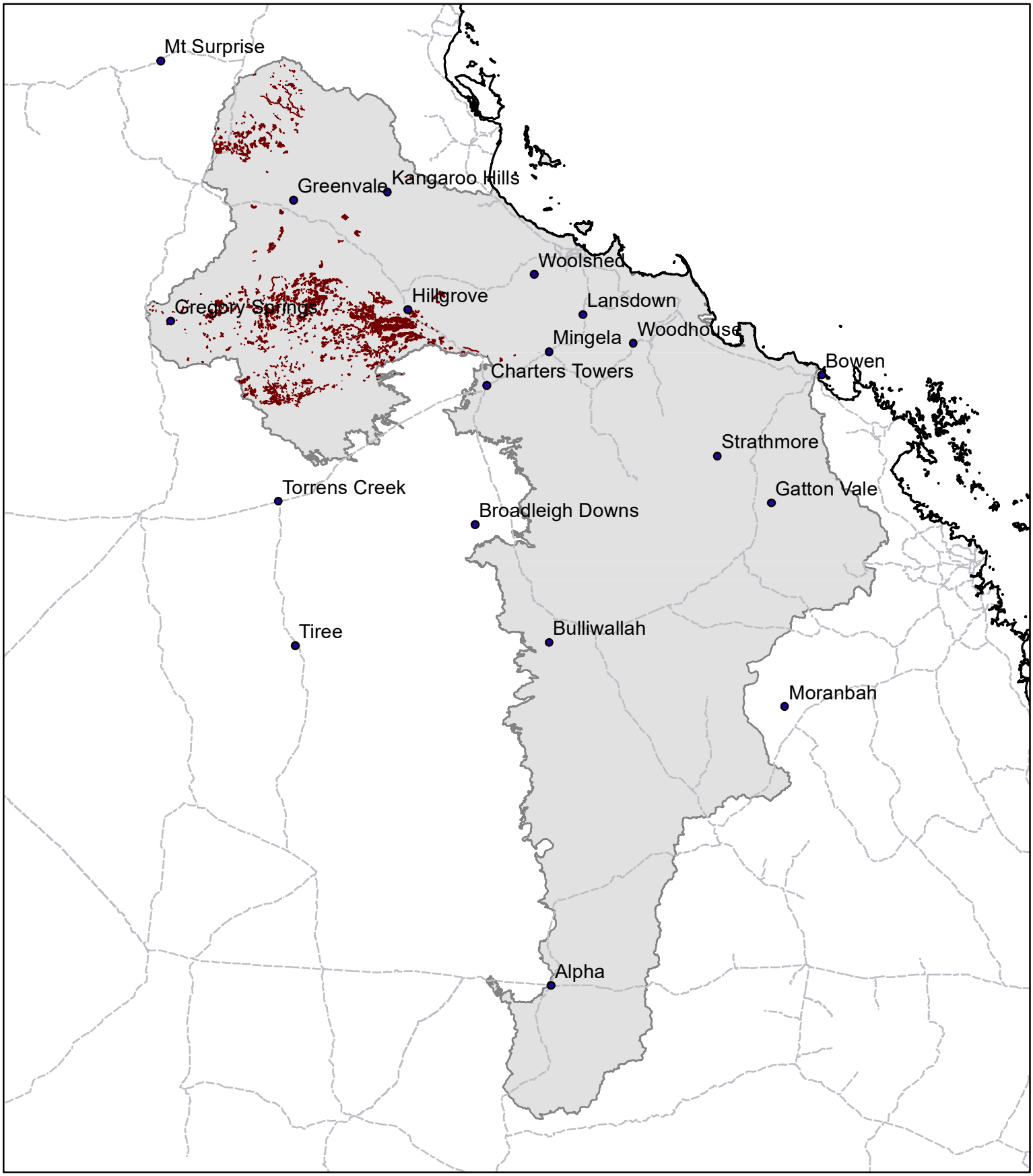
Regional Ecosystems

9.3.10a, 9.3.11b, 9.3.25, 9.3.27a, 9.3.27b, 9.8.10, 9.8.12, 9.8.13, 9.8.5a, 9.8.9

Land units; Agricultural management unit; Soil associations

Land units (Gunn *et al* 1967) Oxford 2 & 3; AMU (DPI 1993) Orion; Soil Associations (Rogers *et al* 1999) Lolworth, Maryvale.

BD01 Black basalt



Area of land type in region: 1%
Median rainfall (region): 440 – 981 mm
Average rainfall (region): 476 – 1112 mm
Area of land type with FPC: 37%
Median FPC: 20%
Median TBA: 8 m2/ha

Queensland Government

Blackwood scrubs on massive soils

Landform	Level to gently undulating plains.
Woody vegetation	Blackwood scrubs associated with Reid river box and blackbutt, and occasional gidgee. Understorey, if present, of currant bush, false sandalwood, bauhinia, yellowwood and whitewood.
Expected pasture composition	** Denotes non-native "Expected Pasture Composition" species.*
Preferred	Desert bluegrass, brigalow grass, bull Mitchell grass, windmill grasses.
Intermediate	Rice grass.
Non-preferred	Wiregrasses, winged chloris, lovegrasses, fairy grass.
Annuals	Ray grass, dropseed, button grass, Flinders grass, small burr grass, native/spider couch, winged chloris, purpletop Rhodes, ruby saltbush, soft roly poly, pigweed.
Suitable sown pastures	Marginal for sown pastures.
Introduced weeds	Parkinsonia, harrisia cactus.
Soil	Uniform, massive dark grey to brown clays (dermosol). Thin sand veneer on the surface. Highly dispersive subsoils. Slight gilgai occurrence.
Description	***Surface*:** Tendency to seal; ***Surface texture*:** sand veneer over light to medium clay; ***Subsoil texture*:** medium to heavy clay.

Water availability: Low

Fertility: Low

Salinity: High salinity throughout profile.

Sodicity: Highly sodic subsoils.

pH: Slightly alkaline to neutral at surface, acid 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 502 – 511 mm				
Pasture type	Median tree cover (TBA m^2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	1090 - 1230	15%	16 - 18
	6 TBA 15 FPC	560 - 580	15%	34 – 35

Enterprise

Breeding

Land use and management recommendations

- Rotational wet seasons spelling to maintain perennial pasture composition.
- Maximise ground cover at end of dry season to reduce soil surface sealing and development of scalds.
- Heavy grazing can lead to loss of preferred pasture species, increases of currant bush, and pastures dominated by undesirable forbs (e.g. gidgee burr).

Land use limitations

- Fragile land type.
- Low fertility, high salinity and highly dispersive subsoils.
- Low soil phosphorus may necessitate use of supplementation for cattle.
- Very high soil erosion hazard. Particularly prone to scalding, gully and tunnel erosion along tracks, fence lines and on sloping lands.

Conservation features and related management

- This land type has been extensively cleared for pasture.

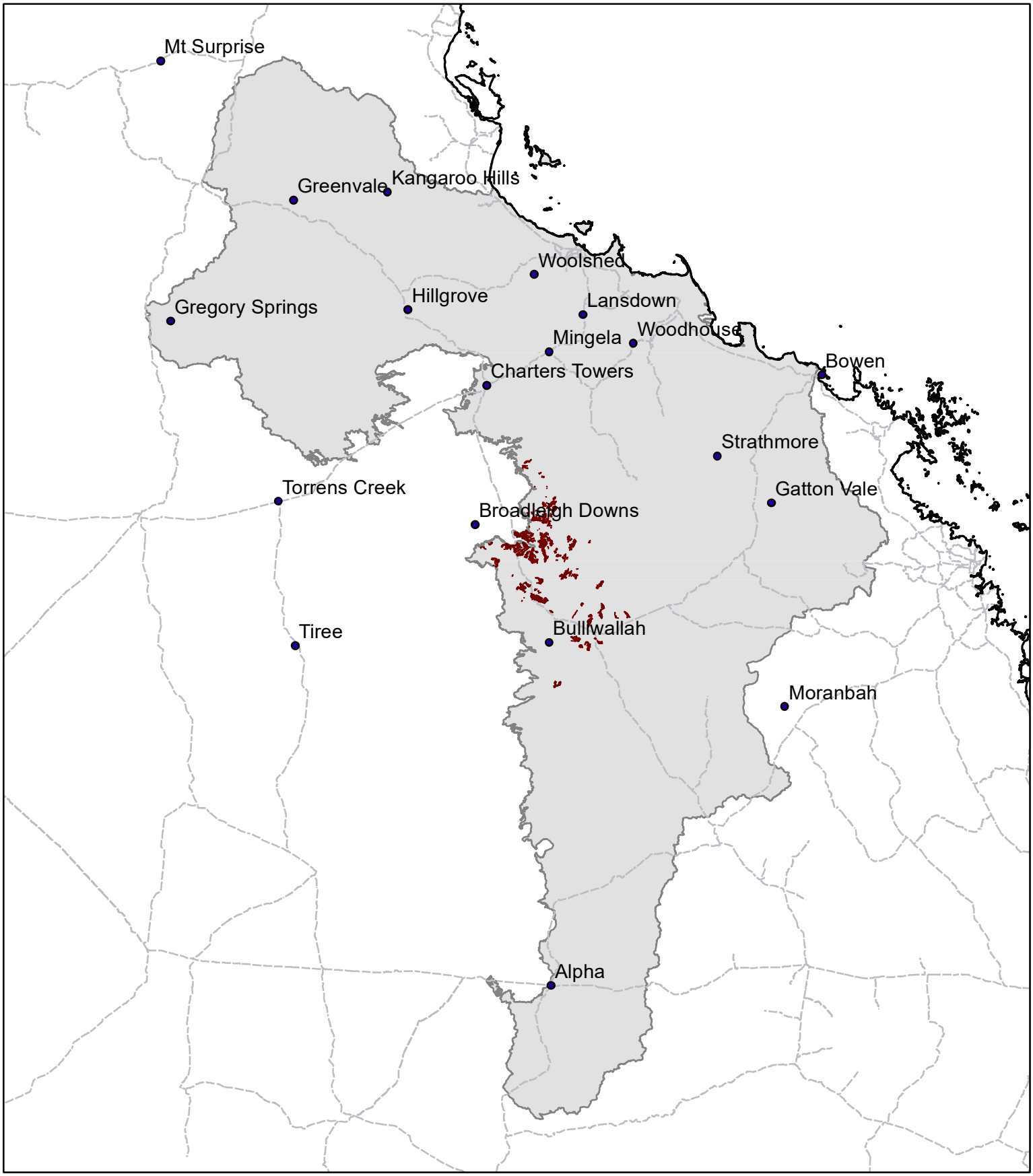
Regional Ecosystems

11.3.8.

Land units; Agricultural management unit; Soil associations

Land units (Gunn *et al* 1967) Somerby 3, Blackwater 3; AMU (DPI 1993) Lonesome; Soil Associations (Roger *et al* 1999) Scartwater, Wambiana, Powlathanga, Victoria Downs.

BD02 Blackwood scrubs on massive soils



Area of land type in region: 0.4%
Median rainfall (region): 440 – 981 mm
Average rainfall (region): 476 – 1112 mm
Area of land type with FPC: 65%
Median FPC: 15%
Median TBA: 6 m2/ha

Queensland Government

Blackwood scrubs on structured clays

Landform	Level to gently undulating plains.
Woody vegetation	Blackwood scrubs associated with Reid river box and blackbutt. Understorey, if present, of currant bush, false sandalwood, bauhinia, yellowwood and whitewood.
Expected pasture composition	** Denotes non-native "Expected Pasture Composition" species.*
Preferred	Desert bluegrass, buffel grass*, curly bluegrass, brigalow grass.
Intermediate	Bull Mitchell grass, silky browntop, windmill grasses.
Non-preferred	Feathertop wiregrass, wiregrasses, winged chloris, fairy grass, lovegrasses.
Annuals	Button grass, Flinders grass, native/spider couch.
Suitable sown pastures	Buffel grass, urochloa, Caatinga stylos, Desmanthus.
Introduced weeds	Rubbervine, parkinsonia, prickly acacia, harrisia cactus, parthenium, mother-of-millions.
Soil	Dark grey to black cracking clays (vertosol). Gilgais present.
Description	***Surface*:** Self-mulching; ***Surface texture*:** light to medium clay; ***Subsoil texture*:** medium to heavy clay.
Water availability	Moderately high.
Fertility	Moderate
Salinity	Moderate salinity <30 cm.

Sodicity

Highly sodic subsoils.

pH

Slightly alkaline to neutral at surface, increasing acidity in 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 502 – 561 mm				
Pasture type	Median tree cover (TBA m^2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	1520 - 1910	25%	6.1 – 7.7
	7 TBA 18 FPC	810 - 1250	25%	9.4 – 14
Sown			30%	

Enterprise

Growing, finishing on established sown pastures.

Land use and management recommendations

- Rotational wet seasons spelling to maintain perennial pasture composition.
- Maintain ground cover of at least 50% at end of dry season to maximise infiltration.
- Heavy grazing can lead to loss of preferred pasture species, increases of currant bush, parthenium and pastures dominated by undesirable forbs (e.g. soft roly poly, gidgee burr).
- Use of fire (4–5 years) after storm rain to control currant bush and maintain desirable pasture composition.

Land use limitations

- Salinity and highly dispersive subsoils.
- Regrowth (blackbutt).
- Limited soil erosion hazard. Prone to sheet, rill and gully erosion along tracks and fence lines and on sloping lands.

Conservation features and related management

- This land type has been extensively cleared for pasture.

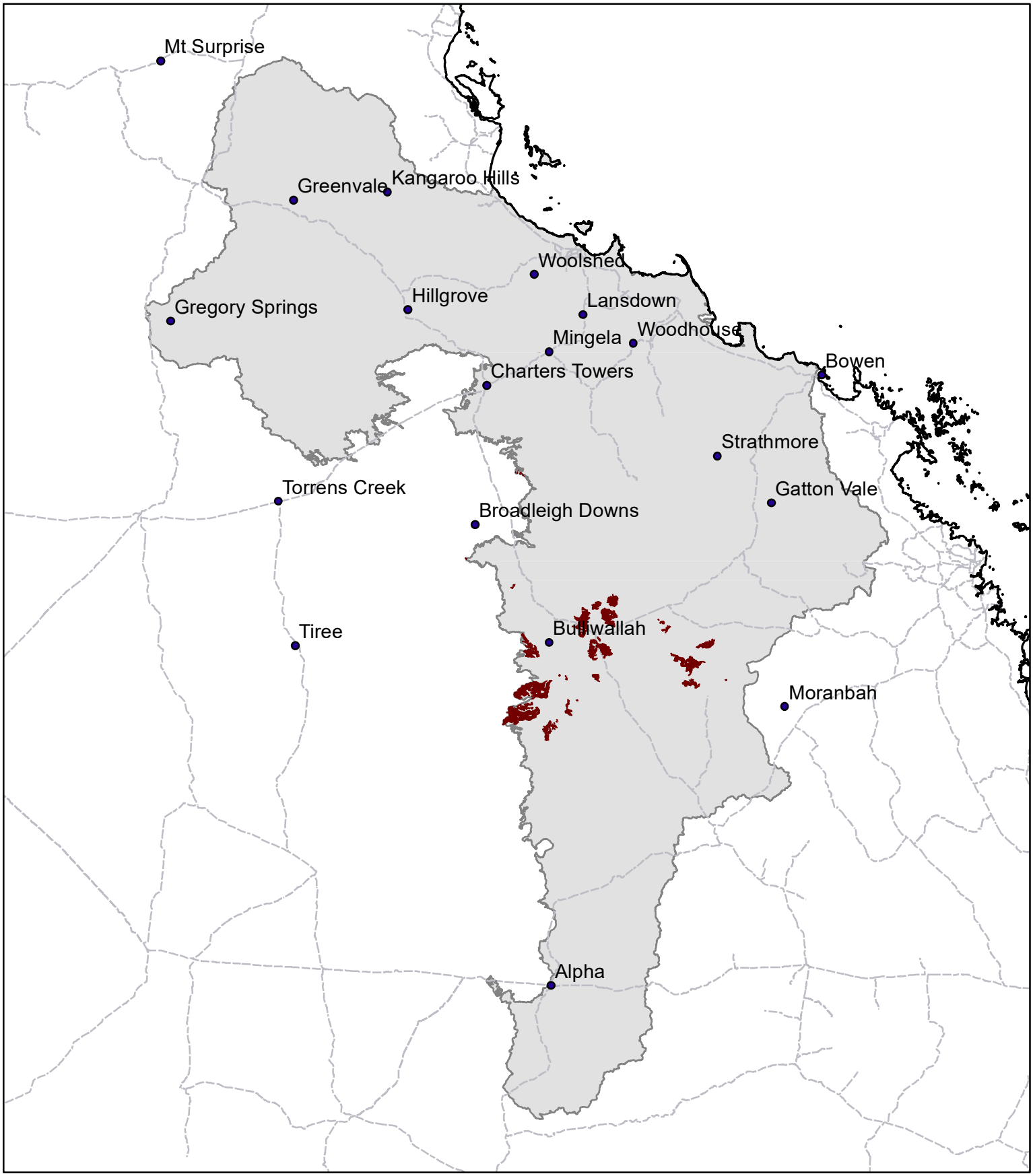
Regional Ecosystems

11.4.5

Land units; Agricultural management unit; Soil associations

Land units (Gunn *et al* 1967) Somerby 3, Blackwater 3; AMU (DPI 1993) Lonesome; Soil Associations (Rogers *et al* 1999) Scartwater, Wambiana, Powlathanga, Victoria Downs.

BD03 Blackwood scrubs on structured clays



Area of land type in region: 1%
Median rainfall (region): 440 – 981 mm
Average rainfall (region): 476 – 1112 mm
Area of land type with FPC: 34%
Median FPC: 18%
Median TBA: 7 m2/ha

Queensland Government

Box and napunyah

Landform	Foot slopes and lower slopes.
Woody vegetation	Molly box and napunyah open woodland. Understorey, if present, of turpentine (south), false sandalwood and wattles.
Expected pasture composition	** Denotes non-native "Expected Pasture Composition" species.*
Preferred	Soft spinifex, desert bluegrass, kangaroo grass.
Intermediate	Barbwire grass, citronella grass.
Non-preferred	Wiregrass, bottlewasher grasses, five-minute grass.
Annuals	Small burr grass.
Suitable sown pastures	Not suitable for sown pastures.
Introduced weeds	
Soil	Skeletal, gravelly texture contrast soils.
Description	***Surface*:** Gravelly; ***Surface texture*:** sandy loam; ***Subsoil texture*:** clay.
Water availability	Low
Fertility	Low

Salinity

Variable, can be moderate to high in subsoils.

Sodicity

High sodicity in subsoils.

pH

Slightly acidic to neutral tending to 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 502 – 624 mm				
Pasture type	Median tree cover (TBA m^2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	1220 - 1730	15%	11 - 16
	8 TBA 20 FPC	550 - 780	15%	25 – 35

Enterprise

Breeding

Land use and management recommendations

- Good catchment country to generate runoff into stock dams.
- Whoa boys are required on roads/tracks to control erosion.
- Rotational wet seasons spelling to maintain perennial pasture composition.
- Maximise ground cover at end of dry season to maximise infiltration and reduce soil erosion.

Land use limitations

- Low fertility.
- Construction of dams can be a problem due to the tendency of the soil to disperse/tunnel when wet.
- Low moisture storage.
- Variable soil erosion hazard. Highly erodible dispersible soils where subsoil is exposed, particularly along fence lines, tracks and on sloping lands and drainage lines.

Conservation features and related management

- These areas may include habitat for the rare and threatened flora species *Cadellia pentastylis.*

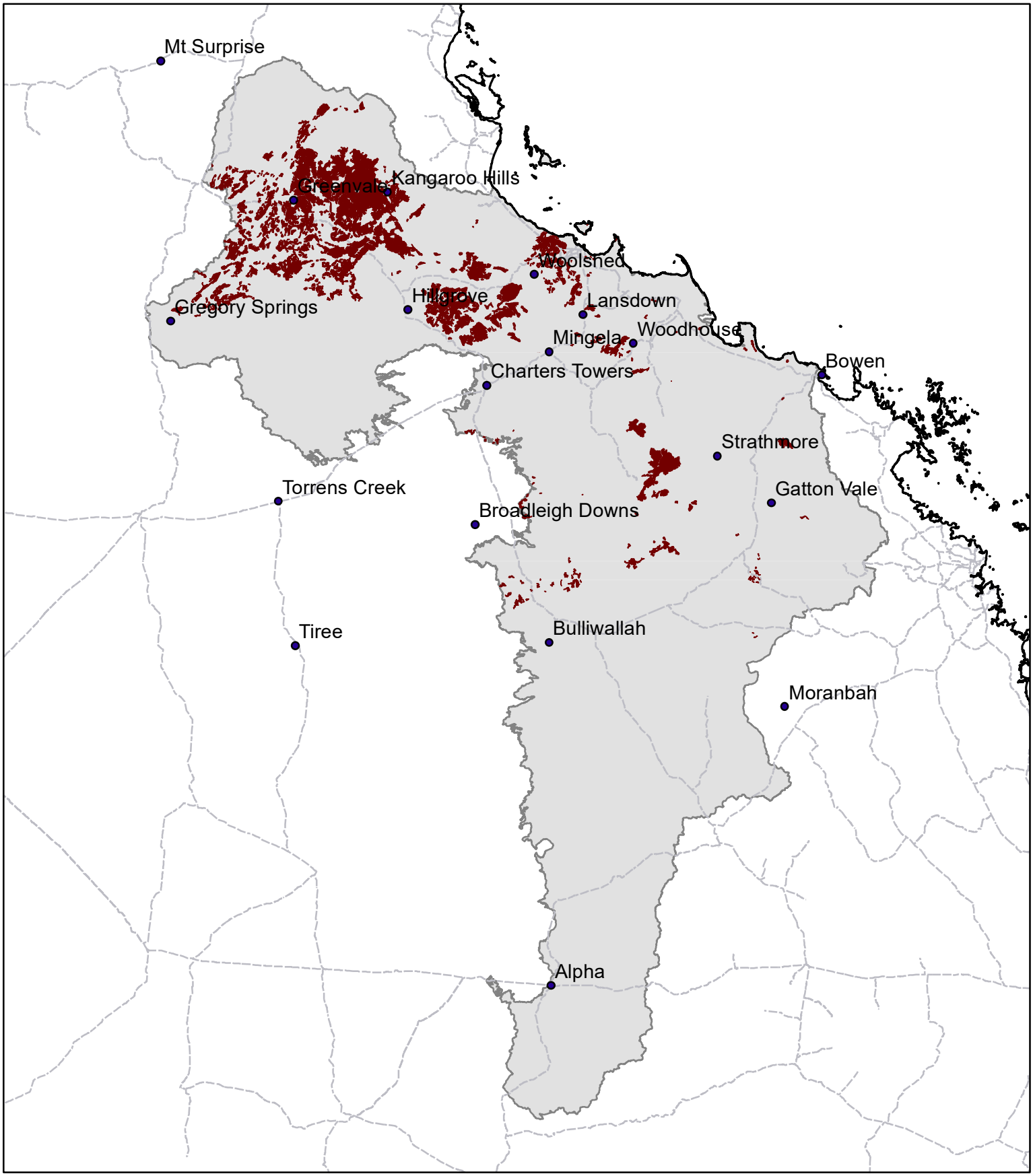
Regional Ecosystems

10.7.2d, 11.7.1, 9.11.5, 9.7.1a.

Land units; Agricultural management unit; Soil associations

Land units (Gunn *et al* 1967) Disney 2, Blackwater 2, Loudon 4, Somerby 2.

BD04 Box and napunyah



Area of land type in region: 5%
Median rainfall (region): 440 – 981 mm
Average rainfall (region): 476 – 1112 mm
Area of land type with FPC: 91%
Median FPC: 20%
Median TBA: 8 m2/ha

Queensland Government

Box country

Landform

Level plains to gently undulating rises.

Woody vegetation

Reid river box or poplar box woodland. Associated with silver-leaved ironbark, ghost gum and bloodwoods in the south. Understorey of false sandalwood, currant bush, leichhardt bean, scrub leopardwood and quinine tree.

Expected pasture composition

** Denotes non-native "Expected Pasture Composition" species.*

Preferred	Desert bluegrass, curly bluegrass, black speargrass, kangaroo grass, cotton panic, buffel grass*, urochloa*.
Intermediate	Golden beard grass, curly windmill, tall chloris, hairy panic, Indian couch*.
Non-preferred	Wiregrass, purple lovegrass, bottlewasher grasses, five-minute grass, fairy grass.
Annuals	Small burr grass, button grass.
Common forbs	Flannel weeds (non-preferred).

Suitable sown pastures

Buffel grass, Shrubby stylo, Caribbean stylo, urochloa.

Introduced weeds

Rubbervine, parkinsonia, bellyache bush, mother-of-millions.

Soil

Variable from uniform, massive grey clays to brown to grey texture contrast soils. Shallow surface horizon in the north.

Description	***Surface*:** Hard-setting; ***Surface texture*:** sandy loam to clay loam; ***Subsoil texture*:** medium clay to medium heavy clay.
Water availability	Low

Fertility

Low to moderate.

Salinity

Low

Sodicity

High sodicity in subsoils.

pH

Slightly acidic (pH 6.6) to neutral tending to 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 494 – 648 mm				
Pasture type	Median tree cover (TBA m^2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	1450 - 2340	25%	5.0 – 8.1
	6 TBA 15 FPC	550 – 1150	25%	10 – 21

Enterprise

Growing

Land use and management recommendations

- Whoa boys are required on roads/tracks to control erosion.
- Rotational wet seasons spelling to maintain perennial pasture composition.
- Maintain vigorous pasture to prevent weed invasion.
- Use fire to maintain preferred pasture composition and suppress woody species.
- Maintain at least 50% ground cover at end of dry season to maximise infiltration and reduce soil erosion.

Land use limitations

- Low fertility.
- Hard-setting surface soils.
- Construction of dams can be a problem due to the tendency of the soil to disperse/tunnel when wet.
- Low moisture storage.
- High levels of regrowth on cleared country.
- Variable soil erosion hazard. Highly erodible where subsoil is exposed, particularly along fence lines, tracks and on sloping lands and drainage lines.

Conservation features and related management

- Older stands of this community are particularly significant for arboreal mammals.
- Subject to invasion by weeds such as rubbervine, mimosa and currant bush.
- Some areas subject to scalding.

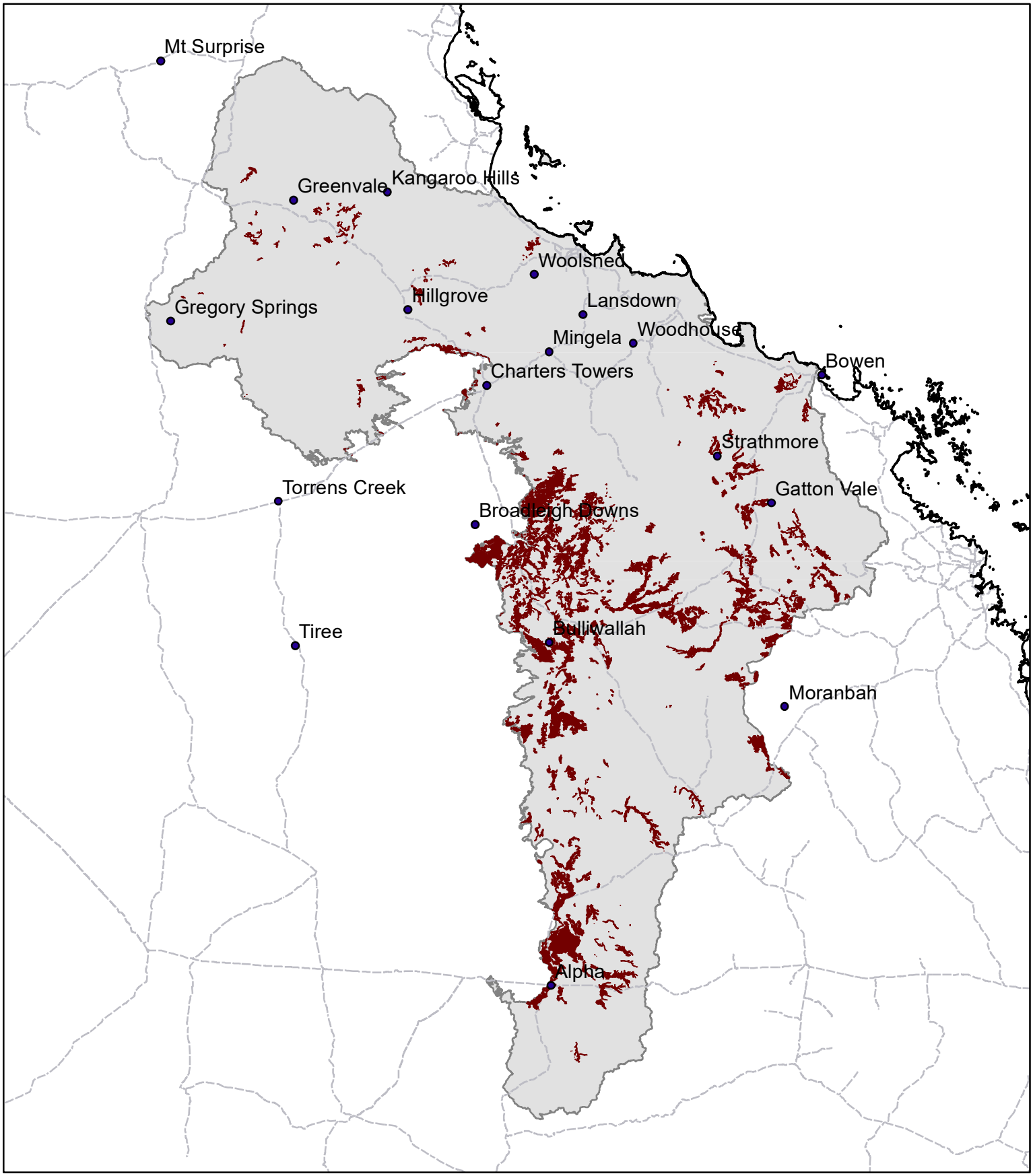
Regional Ecosystems

11.11.9, 11.3.10, 11.5.3, 11.7.3, 11.9.7a, 9.12.32, 9.3.5

Land units; Agricultural management unit; Soil associations

Land units (Gunn *et al* 1967) Pinehill 1, Durrandella 3; AMU (DPI 1993) Lascelles; Soil Associations (Rogers *et al* 1999) Liontown, Pallamana, Scartwater, Warrawee, Myrtlevale, Dotswood.

BD05 Box country



Area of land type in region: 5%
Median rainfall (region): 440 – 981 mm
Average rainfall (region): 476 – 1112 mm
Area of land type with FPC: 63%
Median FPC: 15%
Median TBA: 6 m2/ha

Queensland Government

Brigalow / gidgee scrubs

Landform	Level to gently undulating plains.
Woody vegetation	Gidgee and brigalow scrubs of variable density. Blackbutt and Reid river box associated with brigalow. An understorey of wilga, yellowwood, bauhinia, false sandalwood, currant bush and whitewood.
Expected pasture composition	** Denotes non-native "Expected Pasture Composition" species.*
Preferred	Queensland bluegrass, curly bluegrass, native millet, curly Mitchell grass, buffel grass*, brigalow grass.
Intermediate	Bull Mitchell grass, yabila, silky browntop, windmill grasses.
Non-preferred	Feathertop wiregrass, winged chloris, lovegrasses.
Annuals	Button grass, Flinders grass, native/spider couch.
Suitable sown pastures	Buffel grass, creeping bluegrass, Bambatsi panic, Angleton bluegrass, urochloa, leucaena, Caatinga stylo, butterfly pea, Desmanthus.
Introduced weeds	Parthenium, parkinsonia, rubbervine, harrisia cactus, mimosa, mother-of-millions.
Soil	Self-mulching grey cracking clay with gilgais to massive dark grey to dark brown clays (vertosol).
Description	***Surface*:** Self-mulching or massive; ***Surface texture*:** light clay to medium clay; ***Subsoil texture*:** medium to heavy clay.
Water availability	High
Fertility	Moderately high.

Salinity

Slightly saline in the surface; moderately saline in subsoils.

Sodicity

Moderately sodic in subsoils.

pH

Slightly acidic (pH 6.3) at surface, increasing alkalinity 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 494 – 648 mm				
Pasture type	Median tree cover (TBA m^2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	1840 - 2940	30%	3.3 – 5.3
	7 TBA 18 FPC	680 - 1520	30%	6.4 – 14
Buffel	0 TBA/FPC	3080 - 4690	35%	1.8 – 2.7

Enterprise

Finishing

Land use and management recommendations

- Suitable for pasture improvement.
- Suitable for cropping in areas that have access to irrigation.
- When mixed with other less fertile land types in a paddock, brigalow/gidgee areas are at risk of overgrazing. Land condition should be carefully monitored and management adjusted if necessary to reduce grazing pressure in these areas.
- Rotational wet seasons spelling to maintain perennial pasture composition.
- Heavy grazing encourages germination of woody species, introduced weeds and development of scalds on massive soils.

Land use limitations

- Flooding and waterlogging, particularly in gilgais.
- Restricted access in wet conditions.
- Weed invasion (parthenium).
- Establishment problems with improved pastures due to crusting / cracking or coarse self-mulching surface.
- Limited soil erosion hazard. Prone to rill and gully erosion along tracks and fence lines and on sloping lands.

Conservation features and related management

- Many of these communities have been extensively cleared for pasture development.
- Remaining areas of this land type can provide important regional refuge for some species.
- Habitat for rare species *Sclerolaena everistiana*, *Quassia bidwillii* and *Neoroepera buxifolia* and the painted honeyeater *Grantiella picta*.

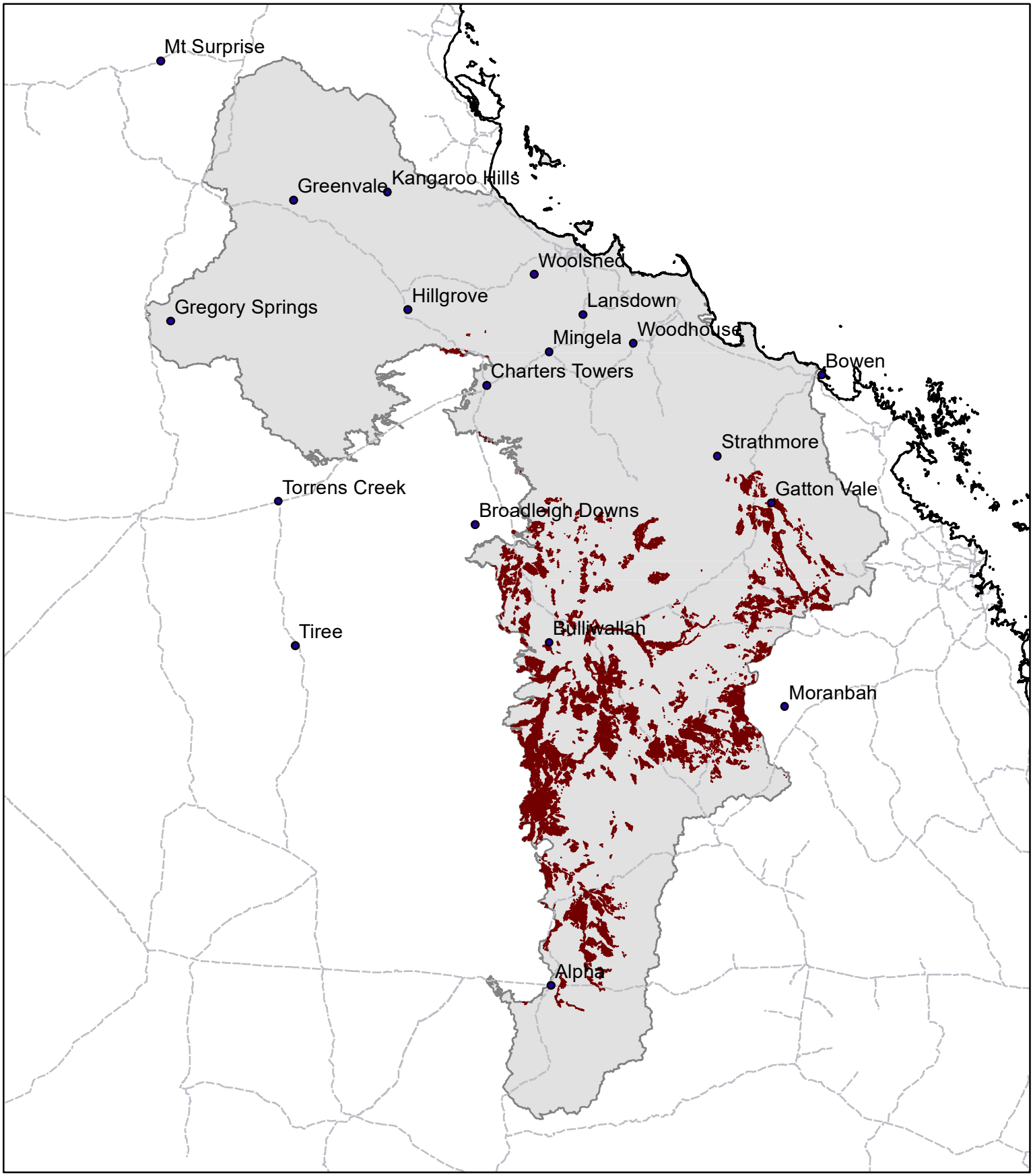
Regional Ecosystems

11.11.19, 11.3.5, 11.4.6, 11.9.5, 9.3.9, 9.4.1, 9.4.3.

Land units; Agricultural management unit; Soil associations

Land Systems (Gunn *et al* 1967) Humboldt, Ulcanbah, Islay, Blackwater, Somerby, Moray, Wondabah, Kinsale; AMU (DPI 1993) Adelong, Glengallen, Glen Idol, Lonesome, Picardy, Rolleston, Springton, Turkey Creek; Soil Associations (Rogers *et al* 1999) Egera, Wambiana, Powlathanga, Victoria Downs.

BD06 Brigalow / gidgee scrubs



Area of land type in region: 6%
Median rainfall (region): 440 – 981 mm
Average rainfall (region): 476 – 1112 mm
Area of land type with FPC: 34%
Median FPC: 18%
Median TBA: 7 m2/ha

Queensland Government

Brown basalt

Landform	Level to gently undulating plains.
Woody vegetation	Narrow-leaved ironbark open woodland associated with silver-leaved ironbark, mountain coolibah, ghost gum and bloodwood.
Expected pasture composition	** Denotes non-native "Expected Pasture Composition" species.*
Preferred	Desert bluegrass, black speargrass, kangaroo grass, curly bluegrass, giant speargrass, plume and brown sorghum.
Intermediate	Golden beard grass, Indian couch*.
Non-preferred	Pitted bluegrass, dark wiregrass, lovegrasses, fairy grass.
Annuals	Button grass, annual lovegrasses (e.g. delicate, soft, stinkgrass, weeping, drooping), liverseed grass*.
Suitable sown pastures	Buffel grass, urochloa, creeping bluegrass, Shrubby stylo, Caribbean stylo, Caatinga stylo. Butterfly pea on deeper soils >90 cm.
Introduced weeds	Rubbervine, parthenium, giant rat's tail grass, calotrope, chinee apple, Captain Cook bush, grader grass.
Soil	Very shallow to moderately deep brown clay loam grading to yellow brown structured clay (ferrosol). Variable basalt rock and surface stone cover.
Description	***Surface*:** Variable stone cover; ***Surface texture*:** clay loam; ***Subsoil texture*:** light medium clay.

Water availability Low to moderate.

Fertility Moderate

Salinity Non-saline

Sodicity Non-sodic

pH Slightly acidic (pH 6.6).

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 564 – 739 mm				
Pasture type	Median tree cover (TBA m^2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	2870 - 2970	30%	3.3 - 3.4
	4 TBA 10 FPC	2200 - 2210	30%	4.4

Enterprise

Fattening and growing.

Land use and management recommendations

- Rotational wet seasons spelling to maintain perennial pasture composition.
- Heavy grazing encourages domination of Indian couch and reduced productivity.
- Maintain at least 50% ground cover at end of dry season to maximise infiltration and reduce soil erosion.

Land use limitations

- Shallow soils.
- Use of fire (4–5 years) after storm rain to address woodland thickening and maintain desirable pasture composition.
- Weed invasion (chinee apple, giant rat's tail grass).
- Establishment problems with improved pastures (stylos) due to high incidence of frosts.
- Limited soil erosion hazard. Prone to rill and gully erosion along tracks and fence lines and on sloping lands.

Conservation features and related management

- These extensively thinned, cleared or cultivated areas provide habitat for rare and threatened flora (*Atalaya calcicola*, *Croton magneticus*, *Ehretia grahamii* and *Wrightia versicolor*) and fauna species.
- Important seasonal wetland habitats associated with this ecosystem.
- Lava tunnels with endemic fauna and significant bat maternity sites.
- Some areas are subject to invasion by *Parthenium hysterophorus.*

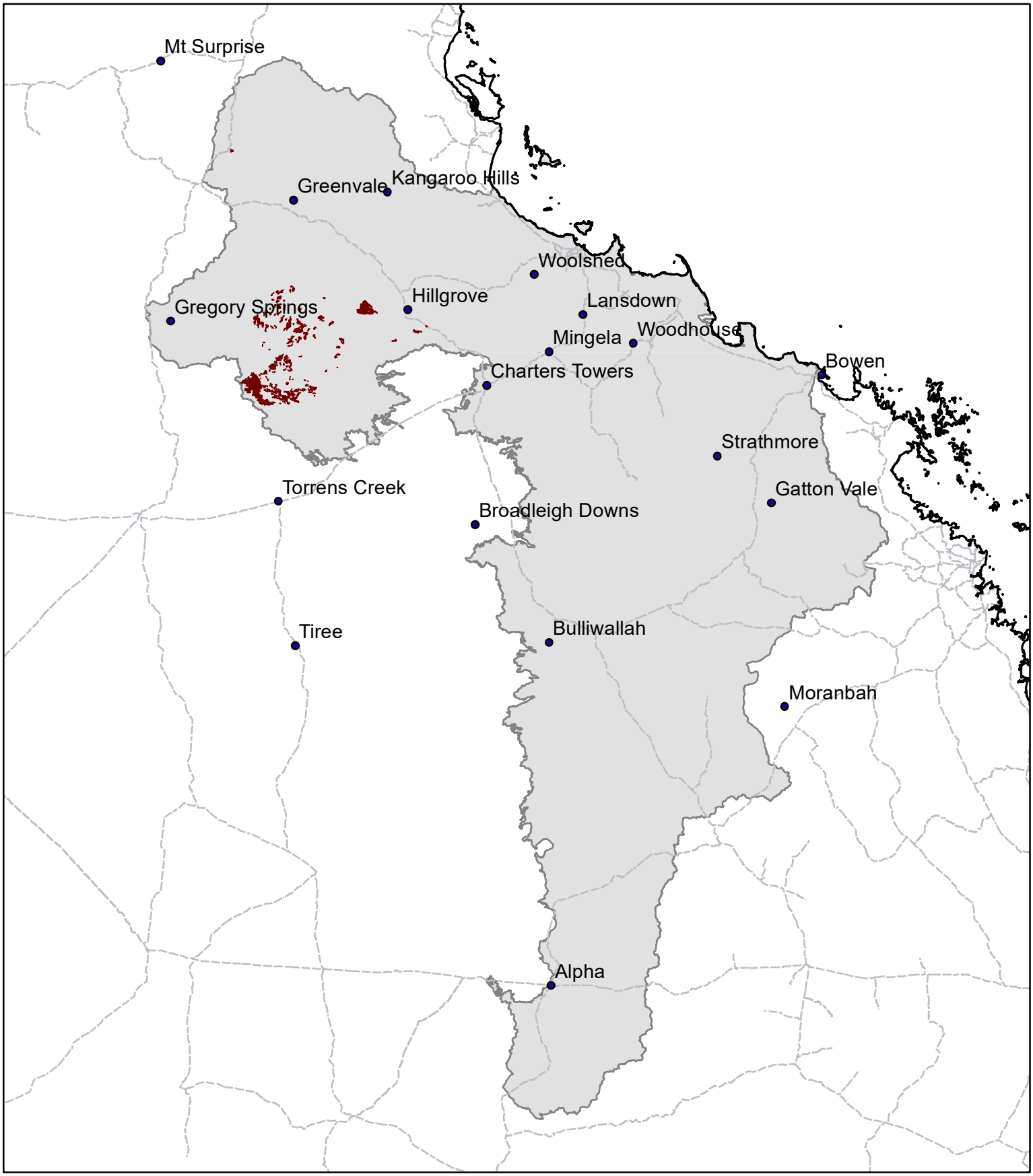
Regional Ecosystems

9.8.11, 9.8.1b, 9.8.4c.

Land units; Agricultural management unit; Soil associations

Soil Associations (Rogers *et al* 1999) Conjuboy, Glencoe.

BD07 Brown basalt



Area of land type in region: 0.3%
Median rainfall (region): 440 – 981 mm
Average rainfall (region): 476 – 1112 mm
Area of land type with FPC: 55%
Median FPC: 10%
Median TBA: 4 m2/ha

Queensland Government

Clayey alluvials

Landform	Level plains.
Woody vegetation	Coolibah or blackbutt woodland with blackwood, brigalow, gidgee, or Reid river box as co-dominants. Understorey of false sandalwood, bauhinia and saplings of overstorey trees.
Expected pasture composition	** Denotes non-native "Expected Pasture Composition" species.*
Preferred	Queensland bluegrass, desert bluegrass, curly bluegrass, curly and hoop Mitchell grass, tall cup grass, native millet, green couch* (naturalised).
Intermediate	Bull Mitchell grass, golden beard grass, silky browntop, Angleton bluegrass*.
Non-preferred	Wiregrasses, canegrasses, tussocky sporobolus, sheda grass*, fairy grass.
Annuals	Flinders grass, button grass, native/spider couch.
Suitable sown pastures	Bambatsi panic, buffel grass, Angleton bluegrass, urochloa, butterfly pea, Caatinga stylo, Desmanthus. Leucaena where not frequently flooded.
Introduced weeds	Rubbervine, bellyache bush, chinee apple, parkinsonia, parthenium, Captain Cook bush, calotrope, grader grass, harrisia cactus, prickly acacia, prickly mimosa bush, mother of millions, noogoora burr, Mexican poppy.
Soil	Self-mulching black, brown or grey cracking clay (black, brown or grey vertosol).
Description	***Surface*:** Strong and fine self-mulching; ***Surface texture*:** medium to heavy clay; ***Subsoil texture*:** medium to heavy clay.
Water availability	Moderate to high.
Fertility	Moderate
Salinity	Non-saline
Sodicity	Slightly sodic at surface, moderate to high in subsoil.
pH	Neutral at surface, alkaline 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 494– 765 mm				
Pasture type	Median tree cover (TBA m^2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	1850 - 3820	30%	2.5 – 5.3
	4 TBA 10 FPC	1270 - 2890	30%	3.4 – 7.7
Sown			35%	

Enterprise

Growing and finishing.

Land use and management recommendations

- When in poor condition can be rehabilitated with sown pastures.
- Suitable for cropping in areas that have access to irrigation.
- When mixed with other less fertile land types in a paddock, alluvial areas are at risk of overgrazing. Land condition should be monitored carefully and management adjusted if necessary to reduce grazing pressure in these areas.
- Rotational wet seasons spelling to maintain perennial pasture composition.
- Use of fire may have a role in suppressing woody plants.
- Heavy grazing encourages germination of introduced weeds, particularly parthenium, parkinsonia.
- Maintain at least 50% ground cover at end of dry season to maximise infiltration and reduce soil erosion.

Land use limitations

- Flooding and waterlogging.
- Restricted access in wet conditions.
- Weed invasion (parthenium, parkinsonia).
- Establishment problems with improved pastures due to crusting / cracking or coarse self-mulching surface.
- Variable soil erosion hazard. Prone to rill and gully erosion, highly erodible along tracks, fence lines and drainage lines.

Conservation features and related management

- These communities provide habitat for a diverse range of fauna, in particular high numbers of nesting birds that use the hollows in mature trees, and herbivores such as macropods and arboreal mammals.
- Some areas of these land types have been extensively cleared for cropping or modified by heavy grazing pressure.
- *Hydrocharis dubia* is a vulnerable waterplant that occasionally occurs in these land types. The rare and threatened *Aponogeton queenslandicus* may occur on heavy clays.
- Subject to invasion by weeds such as rubbervine and parkinsonia.

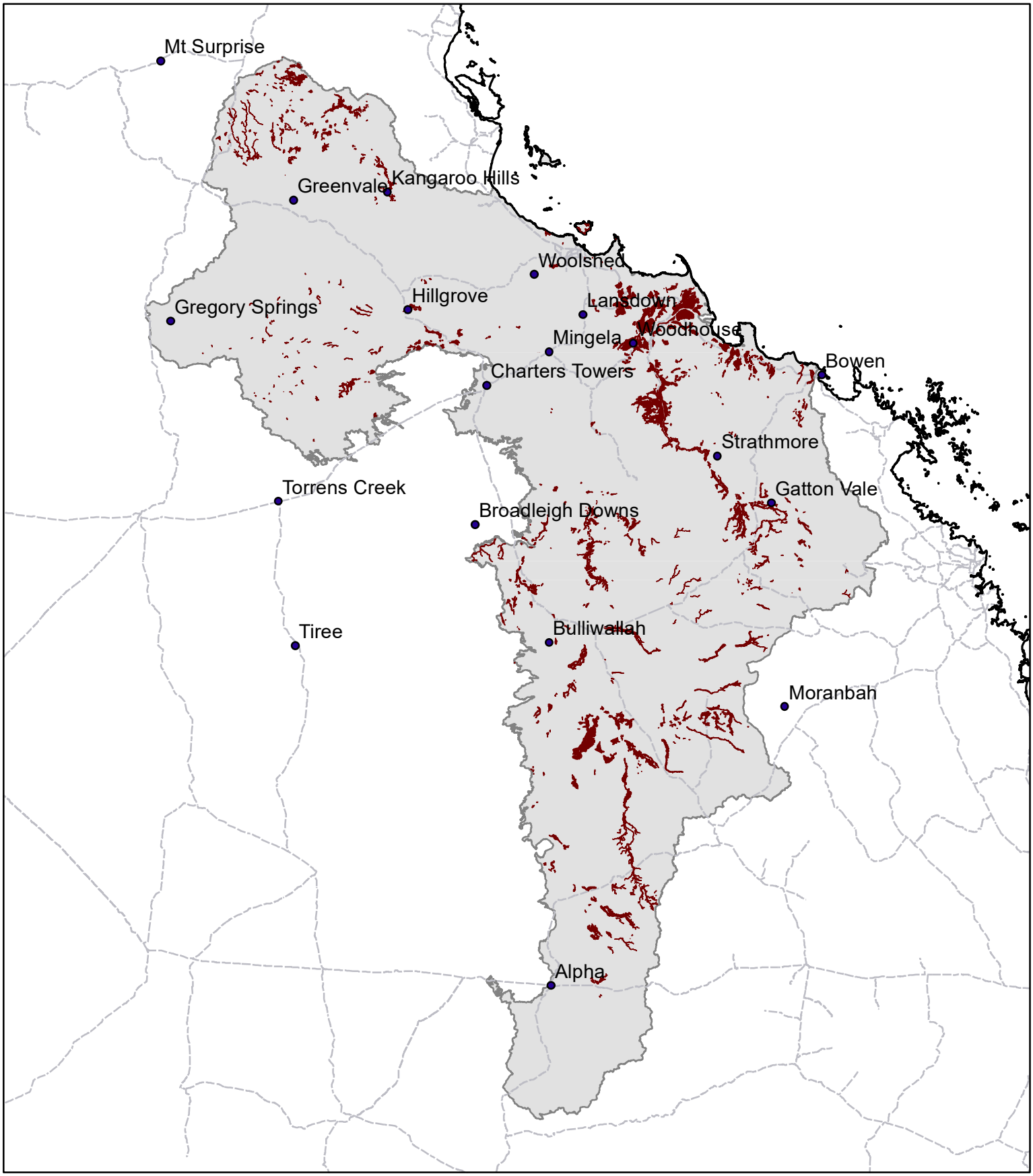
Regional Ecosystems

11.3.13, 11.3.27, 11.3.33, 11.3.34, 11.3.3x1, 9.3.19b, 9.3.23, 9.3.23, 9.3.26, 9.3.26a, 9.3.8.

Land units; Agricultural management unit; Soil associations

Land units (Gunn *et al* 1967) Alpha 3 & 4, Funnel 1, 2, 3, 4 & 5, Comet 2, 4 & 6; AMU (DPI 1993) Moramana; Soil Associations (Rogers *et al* 1999) Yarraman, Manoa.

BD08 Clayey alluvials



Area of land type in region: 3%
Median rainfall (region): 440 – 981 mm
Average rainfall (region): 476 – 1112 mm
Area of land type with FPC: 52%
Median FPC: 10%
Median TBA: 4 m2/ha

Queensland Government

Downs

Landform	Level to gently undulating plains.
Woody vegetation	Treeless plains fringed by coolibah, Reid river box, blackwood, brigalow and gidgee.
Expected pasture composition	** Denotes non-native "Expected Pasture Composition" species.*
Preferred	Hoop and curly Mitchell grass, curly bluegrass, king bluegrass, Queensland bluegrass, native millet, buffel grass*.
Intermediate	Yabila grass, silky browntop, bull Mitchell grass.
Non-preferred	Feathertop wiregrass, white speargrass, fairy grass.
Annuals	Flinders grass, button grass, native/spider couch.
Suitable sown pastures	Angleton bluegrass, Bambatsi panic, Desmanthus, leucaena, butterfly pea, Caatinga stylo.
Introduced weeds	Parthenium, parkinsonia, mimosa, prickly acacia, rubbervine, mother-of-millions.
Soil	Black or brown cracking clay (black or brown vertosol).
Description	***Surface*:** Strong and fine self-mulching; ***Surface texture*:** medium to heavy clay; ***Subsoil texture*:** medium to heavy clay.
Water availability	High
Fertility	Moderate
Salinity	Moderate

Sodicity

Slightly sodic at surface, moderate to high in subsoil.

pH

Neutral at surface, increasing alkalinity with 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 502 – 765 mm				
Pasture type	Median tree cover (TBA m^2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	1970 - 3550	25%	3.3 – 5.9
	8 TBA 20 FPC	1130 - 2120	25%	5.5 – 10

Enterprise

Finishing

Land use and management recommendations

- Rotational wet seasons spelling to maintain perennial pasture composition.
- Maintain vigorous pasture to prevent parthenium invasion.
- Use fire to suppress feathertop wiregrass and encroachment of woody species.

Land use limitations

- Establishment problems with improved pastures due to cracking or coarse self-mulching surface.
- Limited soil erosion hazard. Prone to rill and gully erosion along tracks and fence lines and on sloping lands.

Conservation features and related management

- These grasslands communities support a diverse range of plants and provide habitat for many animals including reptiles (grassland earless dragon *Tympanocryptis pinguicolla*, five-clawed worm skink *Anomalopus mackayi* and grey snake *Hemiaspis damelii)*, macropods and arboreal mammals.
- These grasslands are readily infested with parthenium, especially when ground cover becomes too low.
- Manage grazing pressure and use rotational grazing practices to ensure healthy vigorous pastures and minimise the risk of weed invasion.

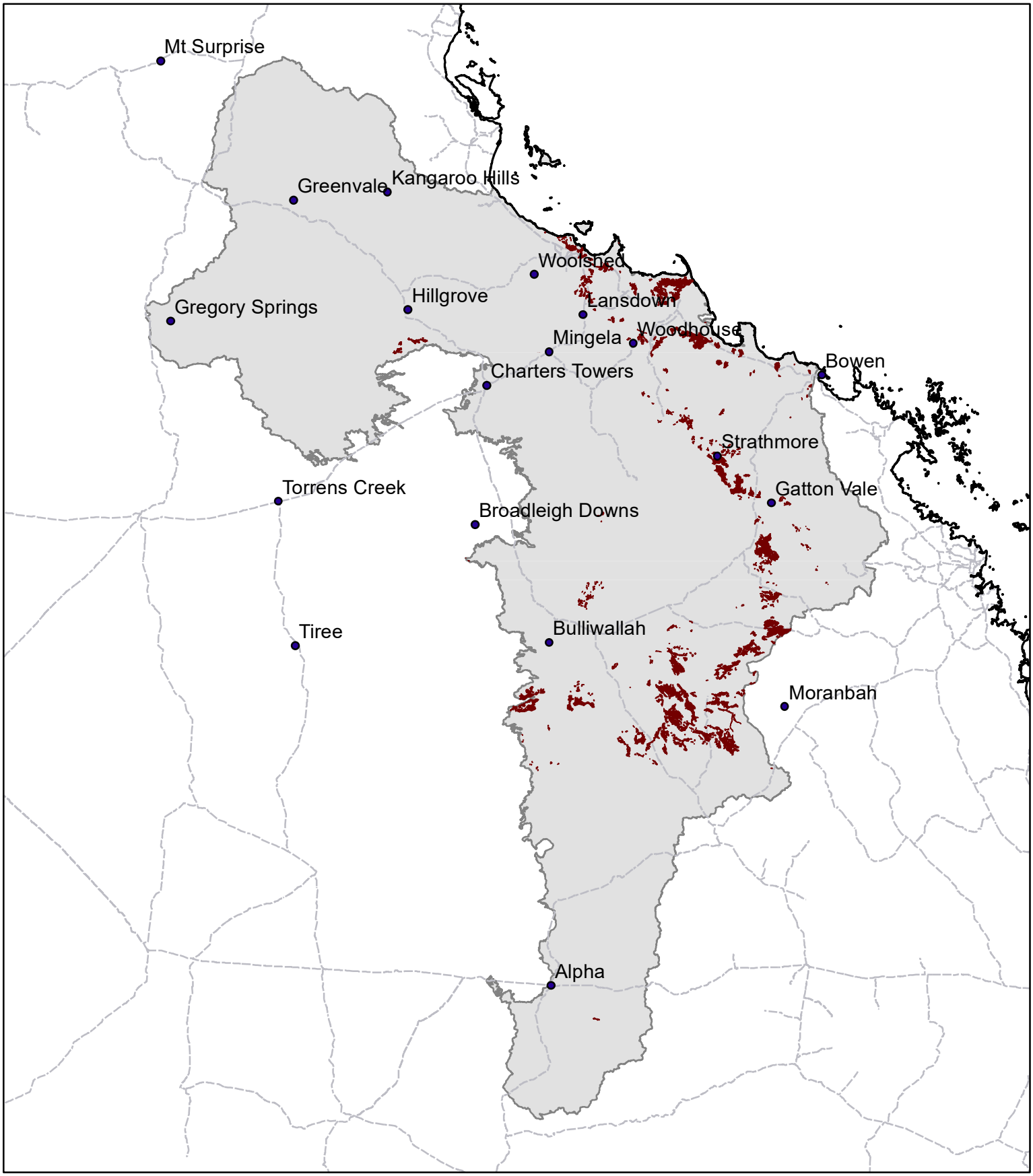
Regional Ecosystems

11.12.1c, 11.3.31, 11.4.11, 11.4.4, 11.8.11, 11.9.3, 2.9.3x1a, 2.9.3x1b.

Land units; Agricultural management unit; Soil associations

Land units (Gunn *et al* 1967) Avon 1 & 3; AMU (DPI 1993) Dooruna; Soil Associations Victoria Downs, Powlathanga, Wambiana, Yarraman, Egera.

BD09 Downs



Area of land type in region: 2%
Median rainfall (region): 440 – 981 mm
Average rainfall (region): 476 – 1112 mm
Area of land type with FPC: 22%
Median FPC: 20%
Median TBA: 8 m2/ha

Queensland Government

Goldfields country – black soils

Landform	Gently undulating to undulating rises.
Woody vegetation	Gum-topped bloodwood very open woodland with or without narrow-leaved ironbark and occasional forest red gum, ghost gum and Reid river box along drainage lines. Patchy understorey of false sandalwood and corkwood wattle.
Expected pasture composition	** Denotes non-native "Expected Pasture Composition" species*.
Preferred	Desert bluegrass, Queensland bluegrass, curly bluegrass, buffel grass*, urochloa*, black speargrass, kangaroo grass.
Intermediate	Indian couch*.
Non-preferred	Dark wiregrass, fairy grass.
Annuals	Flinders grass, button grass.
Suitable sown pastures	Buffel grass, urochloa, Angleton bluegrass, Desmanthus, butterfly pea, Caatinga stylos, Caribbean stylos.
Introduced weeds	Chinee apple, rubbervine, parkinsonia, bellyache bush, prickly acacia, prickly mimosa bush, parthenium, calotrope, harrisia cactus, mother-of-millions, Captain Cook bush.
Soil	Self-mulching black, sometimes red and brown, cracking clay (vertosol).
Description	***Surface*:** Self-mulching; ***Surface texture*:** light clay; ***Subsoil texture*:** medium to heavy clay.

Water availability: High.

Fertility: High.

Salinity: Commonly saline at depth.

Sodicity: Non-sodic.

pH: Neutral surface to alkaline subsoil.

Long-term carrying capacity information (A condition)

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

Median annual rainfall 608 – 612 mm

Pasture type	Median tree cover (TBA m^2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	3020 - 3350	25%	3.5 – 3.9
	7 TBA 17 FPC	1700 - 2160	25%	5.4 – 6.9

Enterprise

Growing and finishing.

Land use and management recommendations

- Rotational wet seasons spelling to maintain perennial pasture composition.
- Whoa boys are required on roads/tracks to control erosion.
- Maintain vigorous pasture to prevent weed invasion.
- When mixed with other less fertile land types in a paddock, goldfields country black soil areas are at risk of overgrazing. Monitor land condition and adjust management if necessary to reduce grazing pressure.
- Use fire to maintain preferred pasture composition and suppress woody species.
- Maintain at least 50% ground cover at end of dry season to maximise infiltration and reduce soil erosion.

Land use limitations

- Prone to weed invasion and overgrazing in larger paddocks.
- Limited soil erosion hazard. Prone to rill and gully erosion along tracks and fence lines and on sloping lands.

Conservation features and related management

- Vulnerable to invasion by weed species such as rubbervine, mimosa, and chinee apple.

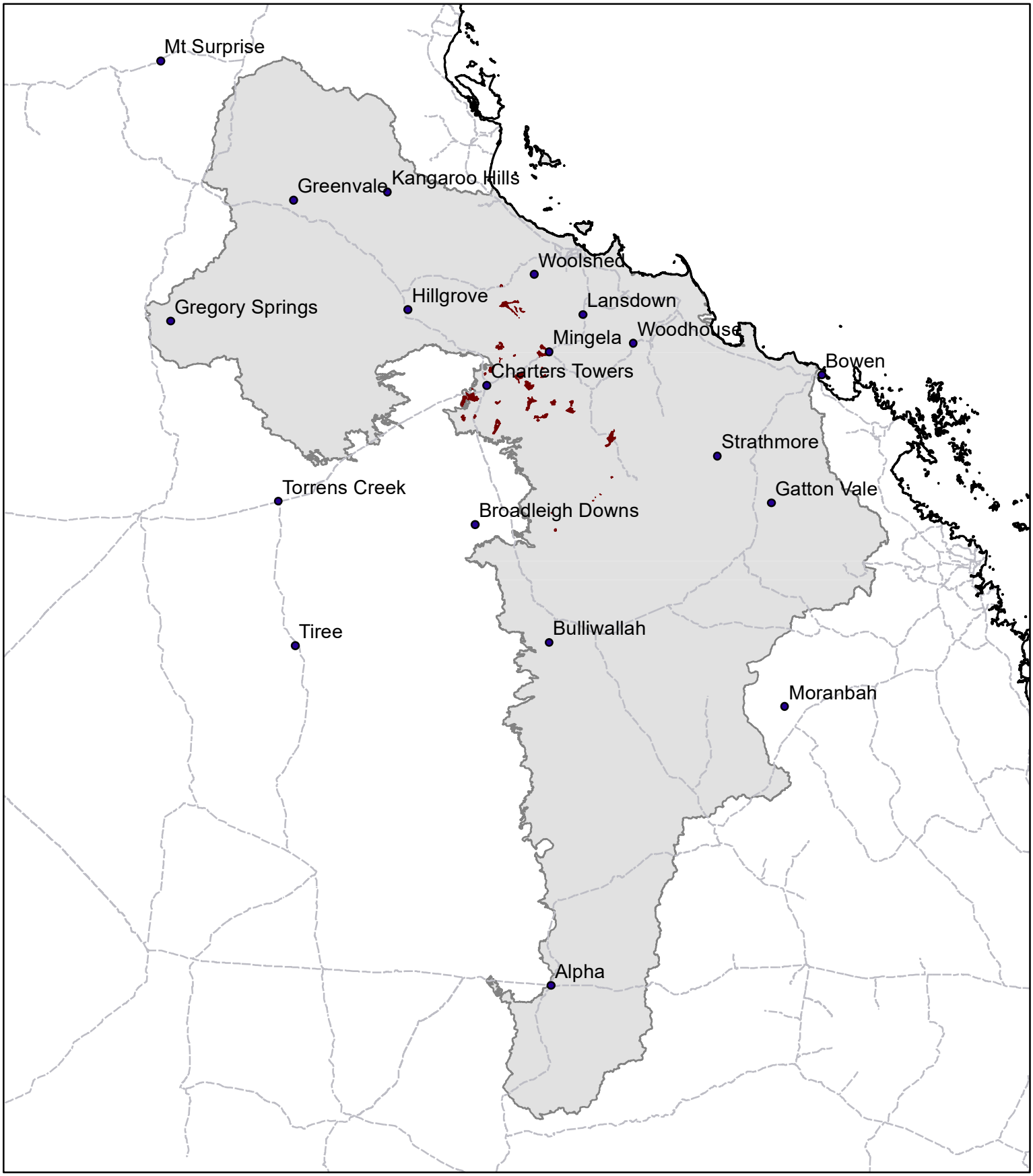
Regional Ecosystems

9.12.1c, 9.12.42.

Land units; Agricultural management unit; Soil associations

Soil Associations (Rogers *et al* 1999) Amity, Mt Ravenswood, Mingela, Tuckers.

BD10 Goldfields country – black soils



Area of land type in region: 0.2%
Median rainfall (region): 440 – 981 mm
Average rainfall (region): 476 – 1112 mm
Area of land type with FPC: 83%
Median FPC: 17%
Median TBA: 7 m2/ha

Queensland Government

Goldfields country – red soils

Landform	Gently undulating to undulating rises.
Woody vegetation	Narrow-leaved ironbark and gum-topped bloodwood woodland with occasional forest red gum and Reid river box along drainage lines. Understorey of currant bush and corkwood wattle.
Expected pasture composition	** Denotes non-native "Expected Pasture Composition" species*.
Preferred	Desert bluegrass, forest bluegrass, curly bluegrass, buffel grass*, urochloa*, cotton panic, black speargrass, kangaroo grass.
Intermediate	Hairy panic, golden beard grass, Indian couch*.
Non-preferred	Feathertop wiregrass, fairy grass, red Natal grass*.
Annuals	Button grass.
Suitable sown pastures	Buffel grass, urochloa, creeping bluegrass, butterfly pea, Shrubby stylo, Caribbean stylo, Caatinga stylo.
Introduced weeds	Chinee apple, rubbervine, bellyache bush, calotrope, lantana.
Soil	Brown loam over red clay duplex soil (chromosol).
Description	***Surface*:** Friable where topsoil exists; ***Surface texture*:** loam; ***Subsoil texture*:** medium to heavy clay.
Water availability	Low

Fertility: Low

Salinity: Non-saline

Sodicity: Non-sodic

pH: Neutral to slightly acid.

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 608 – 739 mm				
Pasture type	Median tree cover (TBA m^2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	2200 - 2270	25%	5.1 – 5.3
	8 TBA 20 FPC	810 - 870	25%	13 – 14

Enterprise

Growing and finishing.

Land use and management Recommendations

- Rotational wet seasons spelling to maintain perennial pasture composition.
- Whoa boys are required on roads/tracks to control erosion.
- Maintain vigorous pasture to prevent weed invasion.
- Use fire to maintain preferred pasture composition and suppress woody species.
- Maintain at least 50% ground cover at end of dry season to maximise infiltration and reduce soil erosion.

Land use limitations

- Narrow-leaved ironbark and bloodwood thickening.
- Increased prevalence of currant bush in the understorey.
- Generally limited soil erosion hazard. However, past land uses, including mining and grazing, have had a widespread legacy effect in terms of sheet, rill and gully erosion.

Conservation features and related management

- Vulnerable to invasion by weed species such as rubbervine, mimosa, and chinee apple.

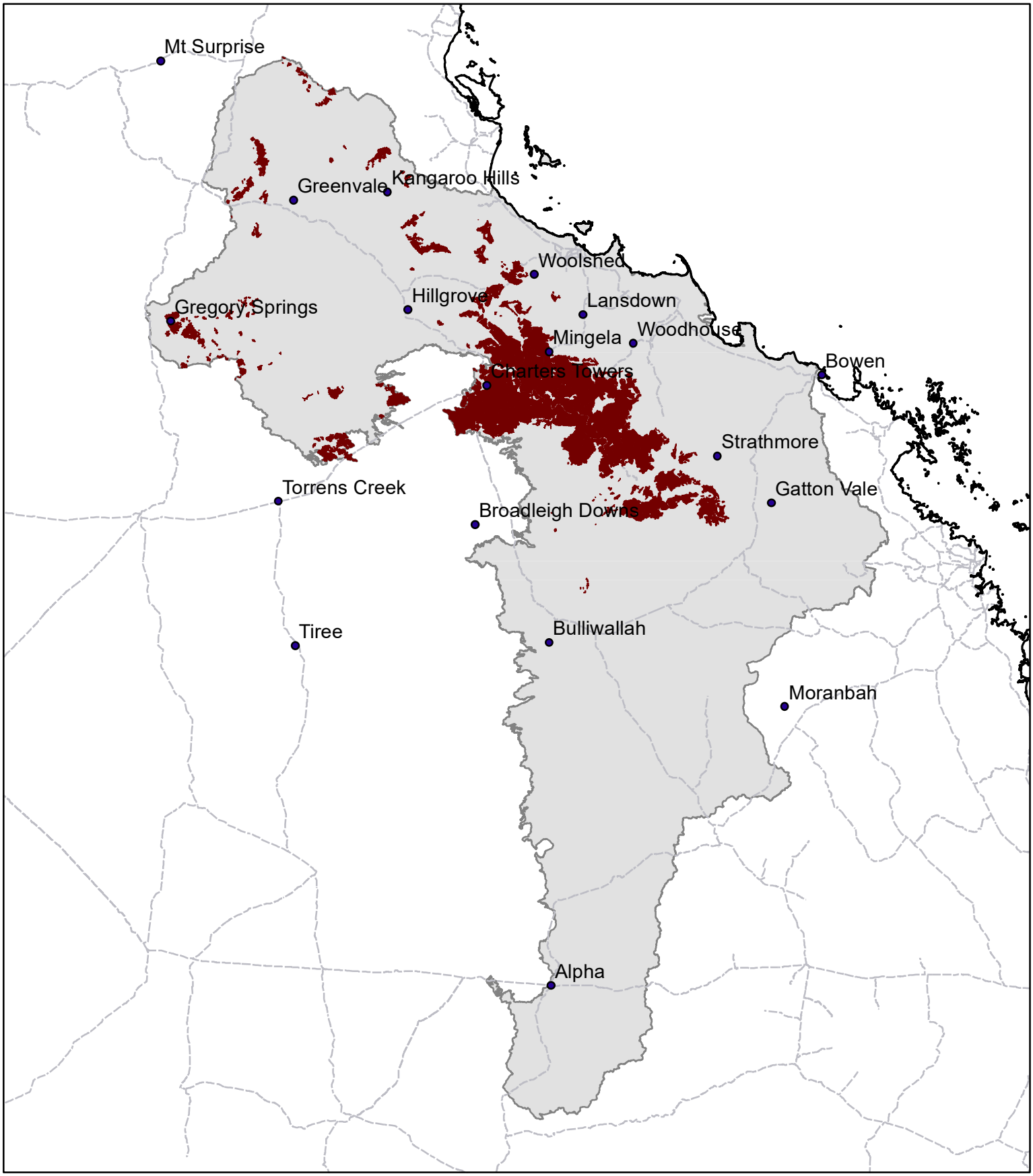
Regional Ecosystems

11.12.1, 9.12.1a, 9.12.1b, 9.12.1d, 9.12.1e, 9.12.1f, 9.12.21.

Land units; Agricultural management unit; Soil associations

Soil Associations (Rogers *et al* 1999) Dalrymple, Charters Towers.

BD11 Goldfields country – red soils



Area of land type in region: 7%
Median rainfall (region): 440 – 981 mm
Average rainfall (region): 476 – 1112 mm
Area of land type with FPC: 92%
Median FPC: 20%
Median TBA: 8 m2/ha

Queensland Government

Lancewood - bendee - rosewood

Landform	Uplands, ranges, dissected ridges, walls and tableland margins.
Woody vegetation	Generally pure communities of dense lancewood, bendee or rosewood. Low open forest areas may have emergent narrow-leaved ironbark and napunyah, with an understorey of emu apple, ironwood, turkey bush, soap bush, wattles, butterfly bush.
Expected pasture composition	** Denotes non-native "Expected Pasture Composition" species*.
Preferred	Cotton panic, tableland couch, hairy panic, kangaroo grass, spinifex.
Intermediate	Brigalow grass, silky oil grass, kangaroo oats.
Non-preferred	Many-headed wiregrass, dark wiregrass, bottlewasher grasses, lovegrasses, summer grass, poverty grass.
Annuals	Small burr grass, comet grass.
Common forbs	Non-preferred species include flannel weeds, mulga fern.
Suitable sown pastures	Generally unsuitable for sown pastures.
Introduced weeds	
Soil	Predominantly shallow rocky soils (rudosols), some deep red earths on tableland margins and occasional pockets of light red clays

Description	***Surface*:** Firm to hard-setting; ***Surface texture*:** sand to sandy loam; ***Subsoil texture*:** no subsoil in rocky areas, light clays where deeper soils are present.
Water availability	Very low.
Rooting depth	Shallow
Fertility	Low total nitrogen, low phosphorus.
Salinity	Low
Sodicity	Non-sodic
pH	Acid.

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 502 – 624 mm				
Pasture type	Median tree cover (TBA m^2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	1130 - 1530	10%	19 - 26
	9 TBA 23 FPC	300 - 460	10%	64 – 97

Enterprise

Breeding

Land use and management recommendations

- Sustainable harvesting of timber for fence posts and rails.
- Potential groundwater recharge area.
- Useful runoff areas for stock dams.

Land use limitations

- Unsuitable for grazing except on red earth and red clay areas.
- Very low soil fertility and moisture storage.
- Steep broken slopes.
- Generally low soil erosion hazard, apart from areas with steep broken slopes.

Conservation features and related management

- Shallow soils, with low water holding capacity and low fertility, often have low ground cover, tend to be prone to erosion and are likely to have slow recovery rates following disturbances (e.g. fire).

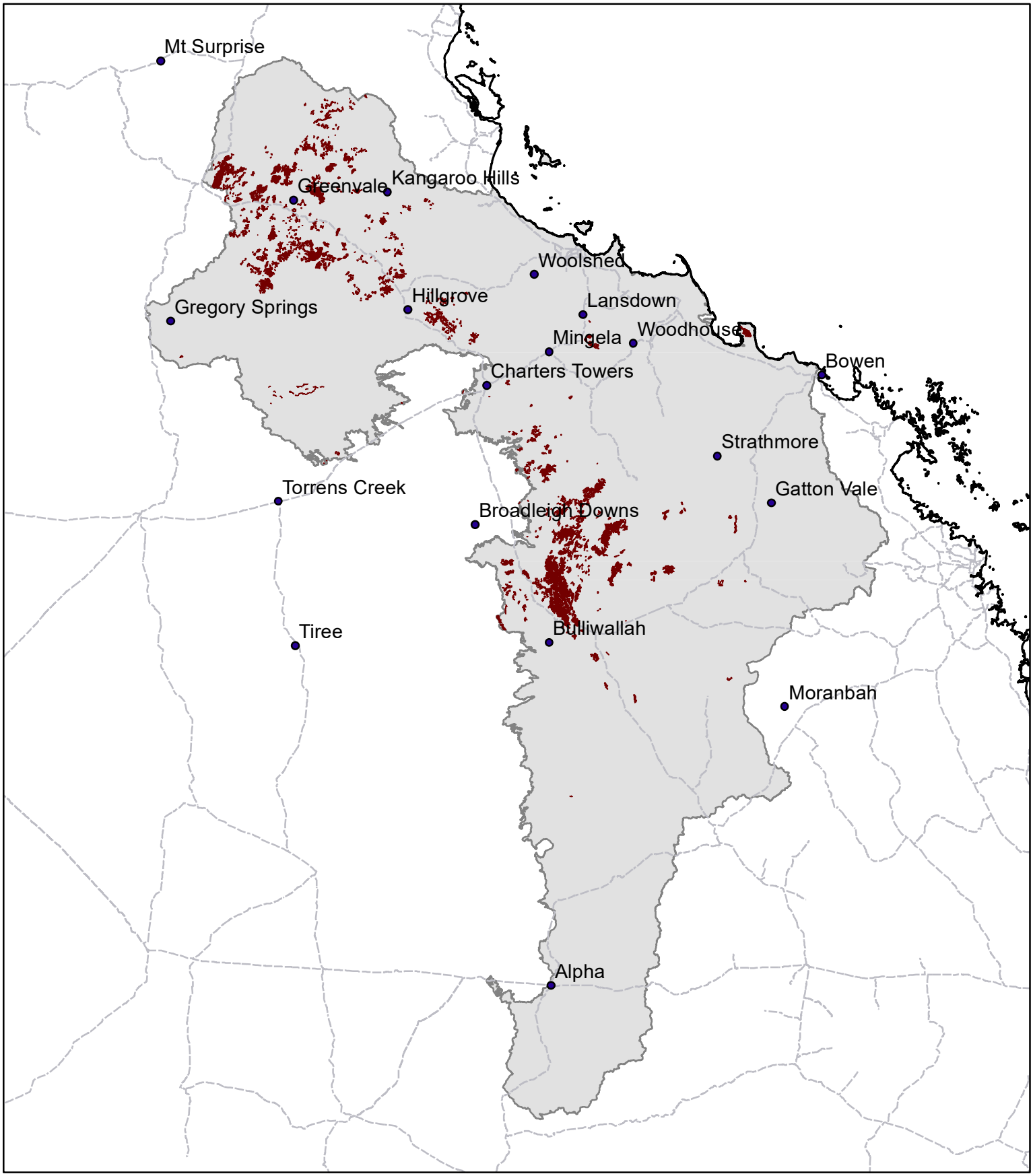
Regional Ecosystems

11.11.2, 11.5.10, 9.12.38b, 9.7.1b, 9.7.1c, 9.7.2a, 9.7.2b, 9.7.4.

Land units; Agricultural management unit; Soil associations

Land units (Gunn *et al* 1967) Durrandella 2, Loudon 2 and 3, Carborough 1 and 2, Copperfield 1; AMU (DPI 1993) Highlands; Soil associations (Burgess 2003) Bellarine, Cherwell, Maywin; Soil Associations (Rogers *et al* 1999) Featherby, Pentland, Barkla.

BD12 Lancewood – bendee – rosewood



Area of land type in region: 2%
Median rainfall (region): 440 – 981 mm
Average rainfall (region): 476 – 1112 mm
Area of land type with FPC: 94%
Median FPC: 23%
Median TBA: 9 m2/ha

Queensland Government

Loamy alluvials

Landform

Level floodplains (north), higher alluvial levees (south).

Woody vegetation

Blue gum, Moreton Bay ash and long-fruited bloodwood woodland with Reid river box and narrow-leaved ironbark in the north. Poplar box woodland associated with blue gum, Moreton Bay ash, bloodwood and ghost gum in the south. Generally understorey, if present, is comprised of saplings of overstorey trees and false sandalwood (south).

Expected pasture composition

** Denotes non-native "Expected Pasture Composition" species*.

Preferred

Desert bluegrass, black speargrass, kangaroo grass, cotton panic, giant speargrass, green couch* (naturalised).

Intermediate

Golden beard grass, pitted bluegrass.

Non-preferred

Wiregrasses, canegrasses, fairy grass.

Annuals

Button grass, liverseed grass*, small burr grass, leafy nineawn.

Suitable sown pastures

Buffel grass, urochloa, Gatton panic, creeping bluegrass, butterfly pea, Shrubby stylo, Caatinga stylo, Caribbean stylo.

Introduced weeds

Rubbervine, bellyache bush, chinee apple, parkinsonia, parthenium, Captain Cook bush, calotrope, Siam weed, giant rat's tail grass, castor oil plant, Mexican poppy.

Soil

Deep structureless loams (tenosol) or deep loam grading to clay.

Description

***Surface*: Loose; *Surface texture*: sandy loam to loam; *Subsoil texture*: loam or clay.**

Water availability

Moderate to high.

Fertility

Moderate

Salinity

Non-saline

Sodicity

Non-sodic or highly sodic in gradational subsoils.

pH

Slightly acidic or neutral profiles.

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 502 – 810 mm				
Pasture type	Median tree cover (TBA m^2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	1870 - 3820	30%	2.5 – 5.2
	8 TBA 20 FPC	850 - 2330	30%	4.2 – 12
Sown			35%	

Enterprise

Growing and finishing.

Land use and management recommendations

- When in poor condition can be rehabilitated with sown pastures.
- Suitable for cropping in areas that have access to irrigation.
- Best managed as separate paddock.
- Fence riparian areas to manage stock access to watercourse and minimise streambank erosion.
- Rotational wet seasons spelling to maintain perennial pasture composition.
- Use of fire may have a role in suppressing woody weeds.
- Heavy grazing encourages germination of introduced weeds.
- Maintain at least 50% ground cover at end of dry season to maximise infiltration and reduce soil erosion.

Land use limitations

- Flooding.
- Weed invasion (rubbervine, chinee apple, bellyache bush).
- Variable soil erosion hazard. Highly erodible where subsoil is exposed, particularly along fence lines, tracks and drainage lines and on sloping lands. Prone to gully erosion adjacent to major watercourses.

Conservation features and related management

- These woodlands provide important drought refuge and wildlife corridors for arboreal fauna.
- Regrowth can be encouraged to allow woodlands to expand and establish connection with other woodland communities.
- Communities are vulnerable to invasion by weeds (e.g. rubbervine, chinee apple, lantana), particularly when ground cover is reduced.

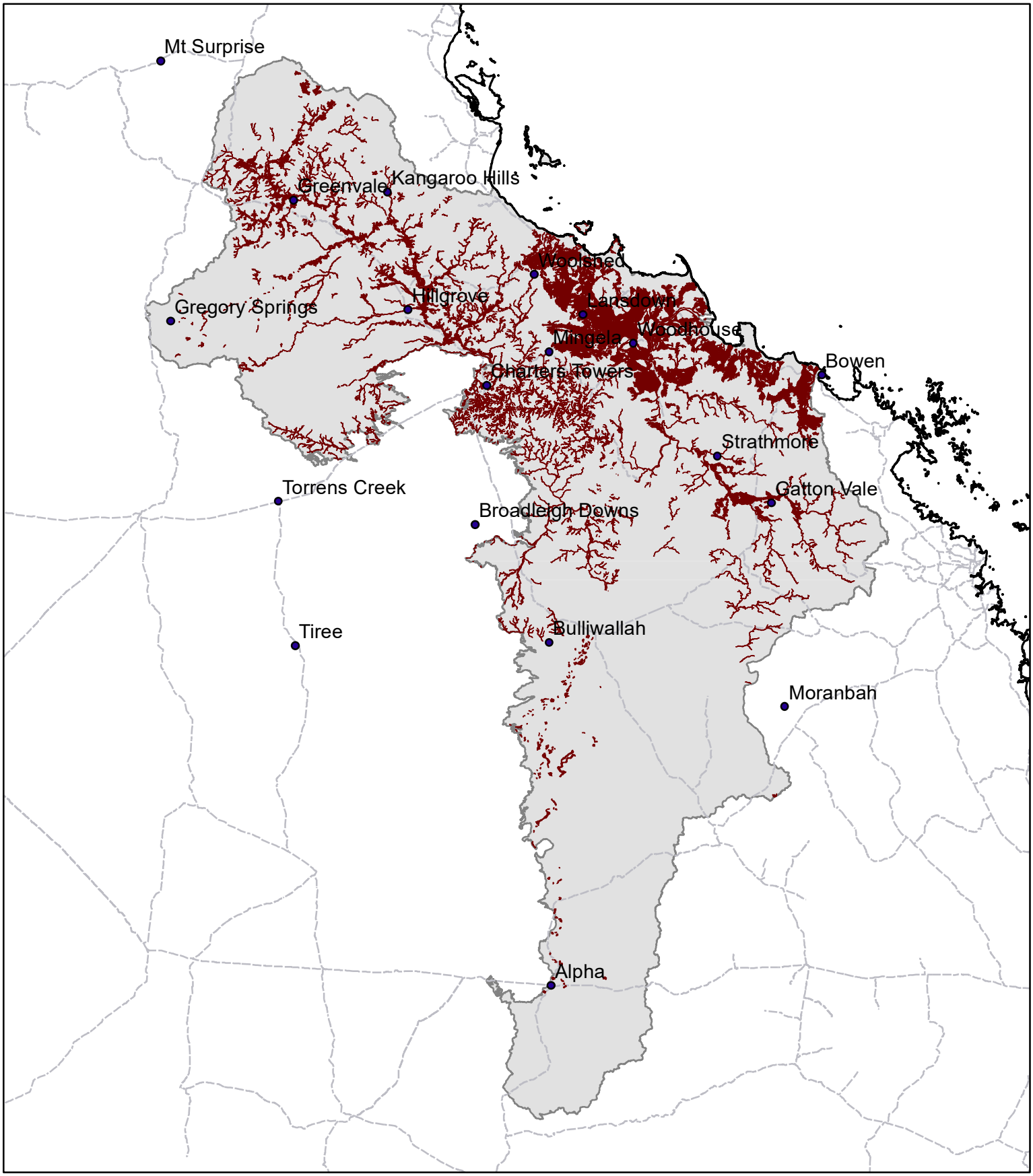
Regional Ecosystems

11.3.30, 11.3.30a, 11.3.30b, 11.3.35a, 11.3.40, 11.3.4a, 11.3.7, 7.3.26a, 7.3.26b, 9.3.1, 9.3.13, 9.3.15, 9.3.16, 9.3.17, 9.3.20, 9.3.22a, 9.3.22b, 9.3.3a, 9.3.3b, 9.3.3c, 9.3.3d, 9.3.6a

Land units; Agricultural management unit; Soil associations

Land units (Gunn *et al* 1967) Alpha 1 & 2, Funnel 1, Comet 1 & 3; Soil Associations (Rogers *et al* 1999) Burdekin, Cape, Fanning, Gainsford, Pandanus, Creek.

BD13 Loamy alluvials



Area of land type in region: 7%
Median rainfall (region): 440 – 981 mm
Average rainfall (region): 476 – 1112 mm
Area of land type with FPC: 72%
Median FPC: 20%
Median TBA: 8 m2/ha

Queensland Government

Narrow-leaved ironbark on deeper soils

Landform	Undulating duplex plains; deep red earth tablelands.
Woody vegetation	Narrow-leaved ironbark in association with box, bloodwoods, silver-leaved ironbark, lemon-scented (spotted) gum, poplar gum (north) and ghost gum woodland. Understorey of paperbark tea tree, quinine, currant bush, red ash, heath myrtle and occasional lancewood, bulloak, rosewood and wattles.
Expected pasture composition	** Denotes non-native "Expected Pasture Composition" species*.
Preferred	Black speargrass, kangaroo grass, desert bluegrass, hairy panic, forest bluegrass, spinifex (west).
Intermediate	Golden beard grass, pitted bluegrass, windmill grasses, barbwire grass, Indian couch*.
Non-preferred	Wiregrasses, summer grass, lovegrasses, five-minute grass, fairy grass, red Natal grass*.
Annuals	Button grass, small burr grass.
Suitable sown pastures	Buffel grass (south), urochloa (north), creeping bluegrass, Shrubby stylo, Caribbean stylo.
Introduced weeds	
Soil	Red or yellow earths or duplex.
Description	***Surface*:** Firm to hard-setting; ***Surface texture*:** loam; ***Subsoil texture*:** sandy to light clay to medium clay.

Water availability: Low – moderate.

Rooting depth: Less than 0.60 m.

Fertility: Low

Salinity: Low

Sodicity: Non-sodic (earths) to sodic (duplex).

pH: Acid (earths) to neutral (duplex).

Long-term carrying capacity information (A condition)

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

Median annual rainfall 502 – 624 mm

Pasture type	Median tree cover (TBA m^2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	1580 - 2050	25%	5.7 – 7.4
	8 TBA 20 FPC	580 - 1080	25%	11 – 20

Enterprise

Breeding

Land use and management recommendations

- Oversowing stylos.

Land use limitations

- Shallow soil.
- Hard-setting surface.
- Variable soil erosion hazard. Highly erodible where subsoil is exposed, particularly along fence lines, tracks and on sloping lands and drainage lines.

Conservation features and related management

- These woodlands, particular more mature hollow-bearing trees, provide important habitat and nesting sites for arboreal mammals. Some bioclimatically isolated of woodland patches provide habitat for a number of unusual occurrences of flora and fauna (e.g. greater glider *Petauroides volens*).
- These woodlands may be subject to widespread timber harvesting.
- Rare and threatened species may be present due to proximity to softwood scrubs.

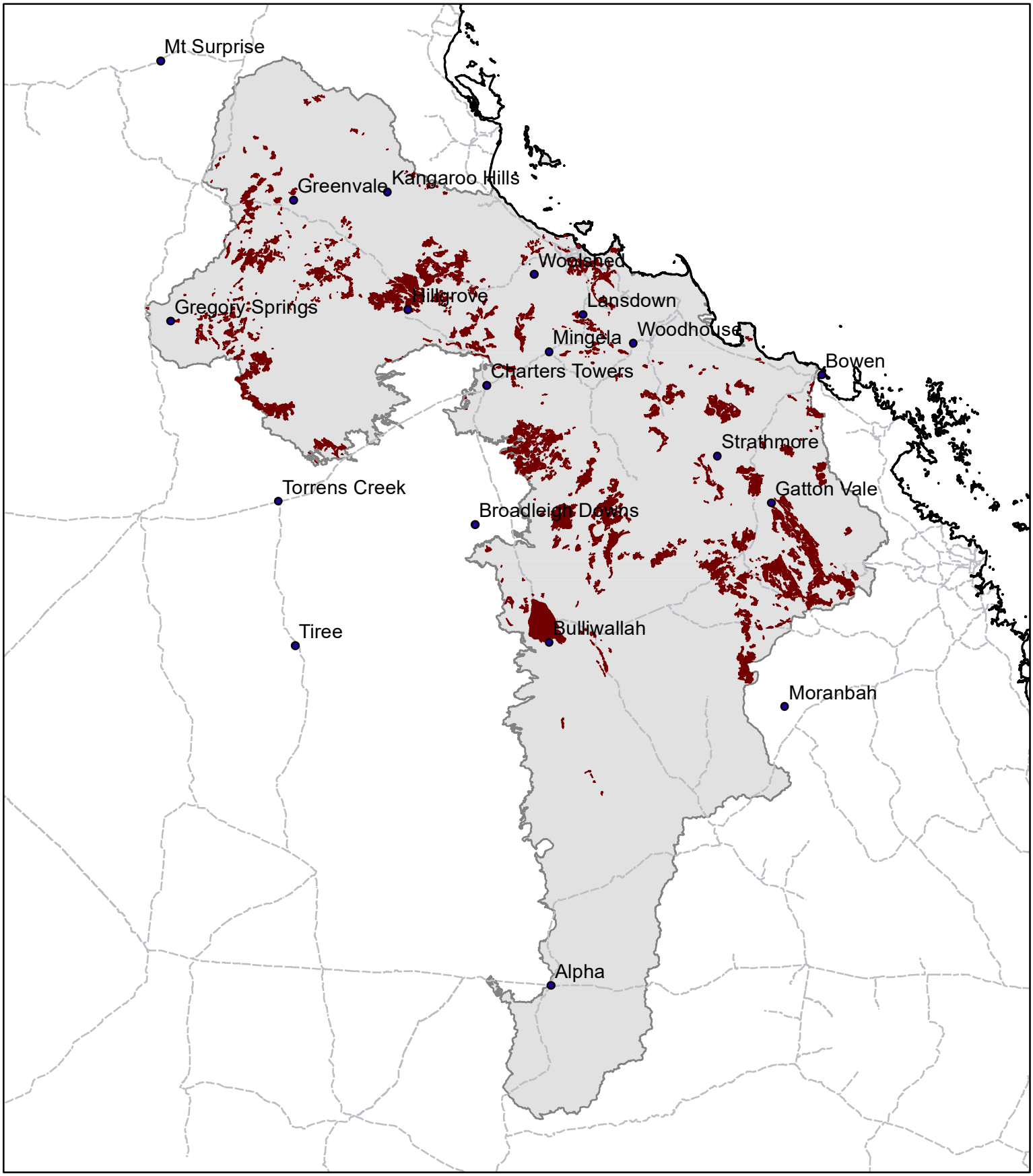
Regional Ecosystems

7.5.1a-d, 7.5.2a-h, 7.5.3a-b, 7.5.4a-g, 9.11.31, 9.12.3, 9.4.2, 9.5.11, 9.5.16, 9.5.17, 9.5.3, 9.5.5a-d, 9.5.5f-g, 9.5.6b, 9.5.7a-b, 9.5.8, 10.5.4c, 11.12.9, 11.12.9a, 11.3.30d, 11.5.20, 11.5.9, 11.7.4, 11.9.9

Land units; Agricultural management unit; Soil associations

Land units (Gunn *et al* 1967; Story *et al* 1967) Copperfield 2 and 3, Hope 1, Cotherstone 1, Durandella 6, Rewan 1 and 2; AMU (DPI 1993) Highlands; Soil Associations (Rogers *et al* 1999; Burgess 2003) Bulliwallah, Carse O'Gowrie, Corea, Ceasar, Hillview, Nial, Nosnillor, Paynes, Pentland, Rangeview, Star, Two Creek, Thorpe, Wairuna; Maywin, Red-one, Anncrouye.

BD14 Narrow-leaved ironbark on deeper soils



Area of land type in region: 6%
Median rainfall (region): 440 – 981 mm
Average rainfall (region): 476 – 1112 mm
Area of land type with FPC: 87%
Median FPC: 20%
Median TBA: 8 m2/ha

Queensland Government

Narrow-leaved ironbark on shallower soils

Landform	Undulating rises to hills and mountains.
Woody vegetation	Narrow-leaved ironbark woodlands with silver-leaved ironbark and Reid river box. Understorey of quinine, currant bush and wattles in the north; and rosewood, red ash, turkey bush, currant bush and hopbush in the south.
Expected pasture composition	** Denotes non-native "Expected Pasture Composition" species*.
Preferred	Black speargrass, kangaroo grass, desert bluegrass, hairy panic, forest bluegrass, golden beard grass.
Intermediate	Barbwire grass, pitted bluegrass, curly windmill grass.
Non-preferred	Wiregrasses, wanderrie grass, bottlewasher grasses, five-minute grass, fairy grass, lovegrasses.
Annuals	Button grass, summer grass, liverseed grass*, small burr grass.
Common forbs	Non-preferred species include flannel weeds, mulga fern.
Suitable sown pastures	Oversow natives – Shrubby and Caribbean stylos.
Introduced weeds	Rubbervine, calotrope, lantana.
Soil	Shallow rocky soils (in the south); texture contrast brown sandy loam over structured yellow brown clay.
Description	***Surface*:** Stony or loose; ***Surface texture*:** sandy loam; ***Subsoil texture*:** light to medium clay.

Water availability: Low

Fertility: Low

Salinity: Non-saline

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 553 – 624 mm				
Pasture type	Median tree cover (TBA m^2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	1640 - 1780	20%	8.2 – 8.9
	9 TBA 22 FPC	780 - 870	20%	17 – 19

Enterprise

Breeding

Land use and management recommendations

- Rotational wet seasons spelling to maintain perennial pasture composition.
- Whoa boys are required on roads/tracks to control erosion.
- Use fire to maintain preferred pasture composition and suppress woody species.
- Maintain at least 50% ground cover at end of dry season to maximise infiltration and reduce soil erosion.

Land use limitations

- Narrow-leaved ironbark thickening.
- Increased prevalence of currant bush in the understorey.
- Moderate soil erosion hazard. Prone to sheet, rill and gully erosion on sloping lands.

Conservation features and related management

- Some vegetation communities contain rare and threatened flora species (*Eucalyptus howittiana*, *Peripleura scabra*, Eungella hairy daisy *Ozothamnus eriocephalus,* square-fruited bloodwood *E. quadricostata*), and provide habitat for arboreal (e.g. yellow-bellied gliders, koalas) and terrestrial mammals (e.g. northern quoll).
- Areas may have been subject to clearing/timber harvesting and grazing and, hence, are vulnerable to invasion by weeds such as grader grass, lantana, *Hyptis suaveolens* and *Bidens pilosa* (cobbler's peg).

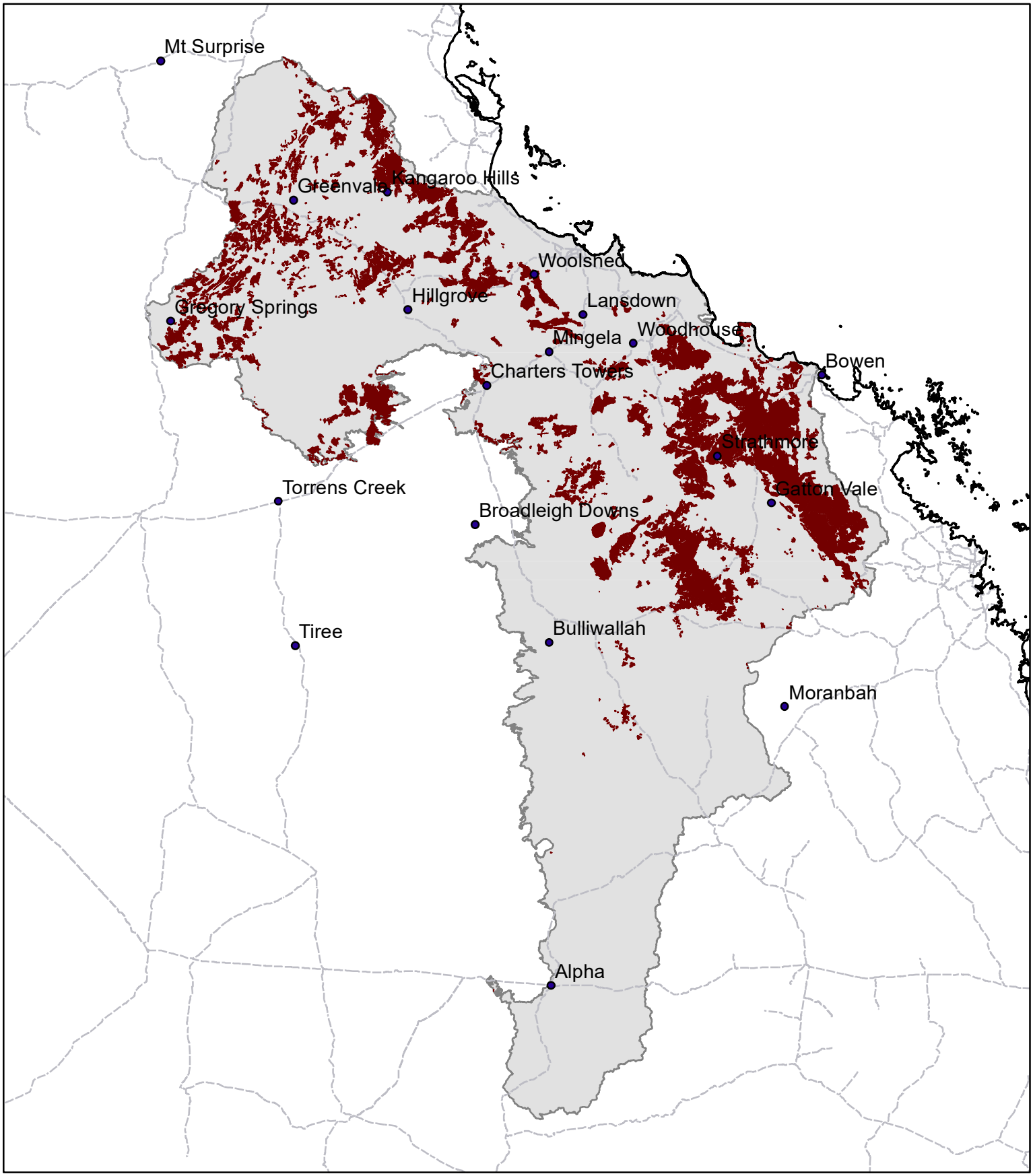
Regional Ecosystems

7.11.48a-b, 7.12.63, 7.12.69a-b, 9.10.7b-c, 9.11.13, 9.11.2, 9.11.22, 9.11.23d, 9.11.29, 9.11.2a-d, 9.11.3a-b, 9.11.3d, 9.11.3f, 9.12.11, 9.12.13c, 9.12.18, 9.12.19, 9.12.22, 9.12.24a-c, 9.12.39, 9.7.3a-c, 10.7.12b, 11.11.15b, 11.12.15, 11.12.18.

Land units; Agricultural management unit; Soil associations

Land units (Gunn *et al* 1967) Bogantungan 1 and 2, Playfair 2, Copperfield 2 and 3; AMU (DPI 1993) Highlands; Soil Associations (Rogers *et al* 1999) Burra, Conolly, Ewan, Greenvale, Pinnacle.

BD15 Narrow-leaved ironbark on shallower soils



Area of land type in region: 12%
Median rainfall (region): 440 – 981 mm
Average rainfall (region): 476 – 1112 mm
Area of land type with FPC: 89%
Median FPC: 22%
Median TBA: 9 m2/ha

Queensland Government

Ranges

Landform	Undulating rises to rolling, steep hills, mountains and mountain ranges.
Woody vegetation	Silver-leaved ironbark (*Eucalyptus shirleyi*) and wattles, narrow-leaved ironbark, lancewood, quinine bush and false sandalwood. Rainforest in the Ingham and Eungella hinterlands.
Expected pasture composition	** Denotes non-native "Expected Pasture Composition" species*.
Preferred	Black speargrass, giant speargrass, kangaroo grass, blady grass, buck spinifex.
Intermediate	Golden beard grass, silky oil grass, Indian couch*.
Non-preferred	Wiregrasses, lovegrasses, rat's tail grasses, fairy grass.
Suitable sown pastures	Marginal for sown pastures, however Shrubby stylo will establish well.
Introduced weeds	Lantana in eastern areas and wild tobacco tree in cleared rainforest areas. The toxic native plants poison peach and zamia palm are occasionally present.
Soil	Shallow rocky skeletal soils on steep slopes with shallow texture contrast soils closer to drainage lines.
Description	***Surface*:** Stony to loose; ***Surface texture*:** sandy to boulders; ***Subsoil texture*:** light to medium clay.
Water availability	Very low.
Fertility	Very low.

Salinity: Low

Sodicity: Low

pH: Slightly acid to 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 502 – 624 mm				
Pasture type	Median tree cover (TBA m^2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	1720 - 1990	10%#	15 - 17
	9 TBA 23 FPC	330 - 700	10%#	42 – 89

livestock will preferentially graze the lower slopes

Enterprise

Breeders

Land use and management recommendations

- Potential groundwater recharge area.
- Many suitable dam sites for stock water.
- Useful runoff areas for stock dams.
- Access tracks are highly prone to erosion.

Land use limitations

- Very low soil fertility and moisture storage.
- Steep broken slopes.
- Difficult access by vehicles.
- Difficult to get clean musters.
- Limited soil erosion hazard. Prone to rill and gully erosion along tracks and fence lines and on sloping lands.

Conservation features and related management

- Rainforest and vine forest communities in the hinterlands and mountain slopes provide habitat for many endemic, rare and threatened flora and fauna species including Eungella Honeyeater, Eungella Day Frog and Eungella Tinker Frog (Liem's Frog).
- The mature hollow-bearing communities also provide habitat for a significant number of arboreal mammals.
- Vulnerable to invasion by weed species such as rubbervine and grader grass.
- Subject to timber harvesting.

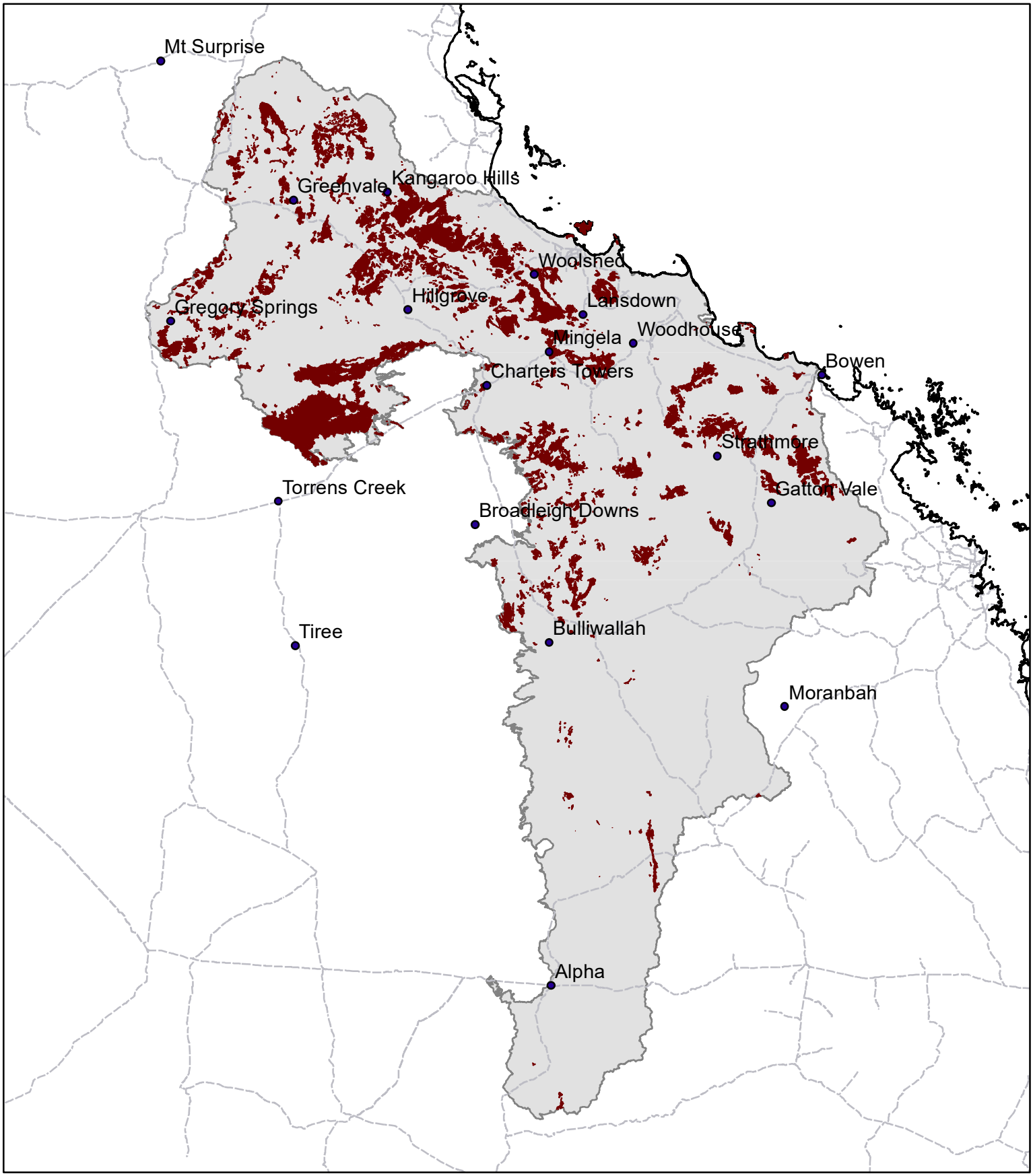
Regional Ecosystems

7.12.38c, 9.11.10, 9.11.14, 9.11.15a, 9.11.16, 9.11.17, 9.11.18, 9.11.1a-b, 9.11.25, 9.11.4a-b, 9.12.10, 9.12.12, 9.12.13a-b, 9.12.14, 9.12.15, 9.12.17, 9.12.20, 9.12.23, 9.12.27, 9.12.29, 9.12.30a-b, 9.12.31b, 9.12.4, 9.12.43a-b, 9.12.44, 9.12.4a-c, 9.12.5, 9.12.6a-b, 9.12.6d, 9.12.7a-c, 11.11.6, 11.11.8, 11.12.10, 11.12.13a-b, 11.12.14, 11.12.16, 11.12.16a, 11.12.16d, 11.12.16x1, 11.12.19, 11.12.7.

Land units; Agricultural management unit; Soil associations

Land Systems (Gunn *et al* 1967) Carborough, Bogantungan; AMU (DPI 1993) Highlands; Soil Associations (Rogers *et al* 1999) Galmara, Miscellaneous Granodiorite, Miscellaneous Igneous, Miscellaneous Metamorphic, Miscellaneous Sedimentary Pinnacle, Rangeview, Severn, Umala, Utchee, Worsley.

BD16 Ranges



Area of land type in region: 8%
Median rainfall (region): 440 – 981 mm
Average rainfall (region): 476 – 1112 mm
Area of land type with FPC: 95%
Median FPC: 23%
Median TBA: 9 m2/ha

Queensland Government

Red basalt

Landform	Level to gently undulating plains.
Woody vegetation	Narrow-leaved ironbark open woodland associated with ghost gum, bloodwood and grevilleas. Rainforest to wet sclerophyll forest in high rainfall areas in north-east.
Expected pasture composition	** Denotes non-native "Expected Pasture Composition" species*.
Preferred	Desert bluegrass, black speargrass, kangaroo grass, curly bluegrass, giant speargrass, plume and brown sorghum.
Intermediate	Indian couch*.
Non-preferred	Pitted bluegrass, dark wiregrass, lovegrasses, fairy grass.
Annuals	Button grass, annual lovegrasses (e.g. delicate, soft, stinkgrass, weeping, drooping), liverseed grass*.
Suitable sown pastures	Buffel grass, urochloa, creeping bluegrass, Rhodes grass, Shrubby stylo, Caribbean stylo, Caatinga stylo.
Introduced weeds	Rubbervine, parthenium, giant rat's tail grass, calotrope, chinee apple, Captain Cook bush, grader grass, lantana.
Soil	Shallow, occasionally moderately deep, reddish brown clay loam grading to light clay (ferrosol). Basalt rock and surface stone are common features.
Description	***Surface*:** Variable stone cover; ***Surface texture*:** clay loam; ***Subsoil texture*:** light medium clay.

Water availability: Moderate

Fertility: Moderate

Salinity: Non-saline

Sodicity: Non-sodic

pH: Slightly acidic (pH 6.6).

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 564 – 739 mm				
Pasture type	Median tree cover (TBA m^2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	3100 - 3640	30%	2.7 - 3.1
	7 TBA 18 FPC	1830 - 2040	30%	4.8 – 5.3

Enterprise

Fattening and growing.

Land use and management recommendations

- Rotational wet seasons spelling to maintain perennial pasture composition.
- Heavy grazing encourages domination of Indian couch and reduced productivity.

Land use limitations

- Use of fire (4–5 years) after storm rain to address woodland thickening and maintain desirable pasture composition.
- Weed invasion (chinee apple, giant rat's tail grass).
- Establishment problems with improved pastures (stylos) due to high incidence of frosts.
- Limited soil erosion hazard. Prone to rill and gully erosion along tracks and fence lines and on sloping lands.

Conservation features and related management

- These woodlands, particular more mature hollow-bearing trees, provide important habitat and nesting sites for arboreal mammals including yellow-bellied gliders and koalas. Also provide habitat for the Eungella hairy daisy *Ozothamnus eriocephalus.*
- Areas may have been subject to clearing/timber harvesting and grazing and, hence, are vulnerable to invasion by weeds such as grader grass, lantana, rubbervine.

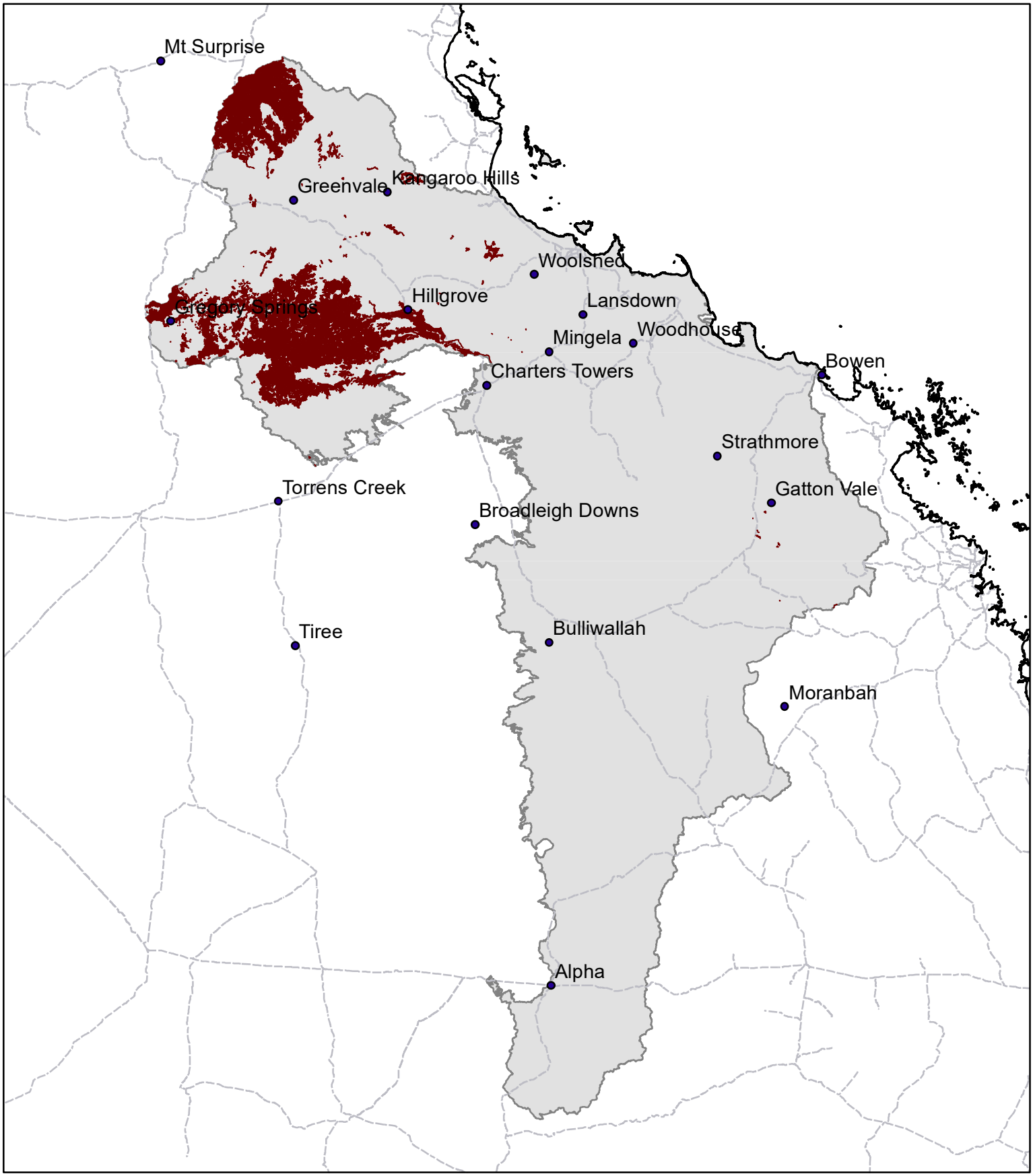
Regional Ecosystems

7.5.4f, 7.8.10a-b, 7.8.15a-b, 7.8.16a-c, 7.8.17a-c, 7.8.18a-d, 7.8.7a, 7.8.8b, 9.12.16, 9.8.1a, 9.8.1c, 9.8.4a-b, 11.8.14.

Land units; Agricultural management unit; Soil associations

Soil Associations (Rogers *et al* 1999) Hillgrove, Felspar, Nulla, Pin Gin, Newlands.

BD17 Red basalt



Area of land type in region: 7%
Median rainfall (region): 440 – 981 mm
Average rainfall (region): 476 – 1112 mm
Area of land type with FPC: 78%
Median FPC: 18%
Median TBA: 7 m2/ha

Queensland Government

Silver-leaved ironbark

Landform	Plains.
Woody vegetation	Open woodlands of silver-leaved ironbark with narrow-leaved ironbark, bloodwood, mountain coolibah (south – clay soil) and box. False sandalwood, quinine, prickly pine, desert oak, wattles and currant bush understorey.
Expected pasture composition	** Denotes non-native "Expected Pasture Composition" species*.
Preferred	Golden beard grass, desert bluegrass, black speargrass, kangaroo grass, Queensland bluegrass (south), native millet (south – clay soil), forest bluegrass.
Intermediate	Barbwire grass, hairy panic.
Non-preferred	Feathertop and white speargrass (south – clay soil); dark wiregrass, lovegrasses, fairy grass, five-minute grass, bottlewasher grasses, wanderrie grass, red Natal grass*.
Annuals	Small burr grass, button grass, comet grass.
Common forbs	Non-preferred species include flannel weeds, pigweed.
Suitable sown pastures	Stylo (Shrubby, Caribbean and Caatinga) on lighter soils; creeping bluegrass, Angleton bluegrass, buffel grass, Bambatsi panic, butterfly pea on deeper soils.
Introduced weeds	Parthenium, parkinsonia, prickly acacia (clay soils).
Soil	Texture contrast soils (sodosols, chromosols), cracking clays (vertosols) (south).
Description	***Surface*:** firm to hard-setting to self-mulching (south); ***Surface texture*:** loam to clay; ***Subsoil texture*:** light to heavy clay.
Water availability	Low to high.

Rooting depth

60–100 cm (variable).

Fertility

Low to medium.

Salinity

Low

Sodicity

Non-sodic

pH

Acid

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 494 – 564 mm				
Pasture type	Median tree cover (TBA m^2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	1230 - 1630	25%	7.2 – 9.5
	6 TBA 15 FPC	410 - 800	25%	15 – 29

Enterprise

Breeding

Land use and management recommendations

- Oversowing with stylos.

Land use limitations

- Woodland thickening.
- Low soil moisture.
- Low soil fertility.
- Hard-setting surface soils.
- Limited soil erosion hazard. Prone to sheet, rill and gully erosion along tracks and fence lines and on sloping lands.

Conservation features and related management

- Rare or uncommon flora species are associated with these woodlands including *Acacia jackesiana, Eucalyptus lockyeri, Velleia macrocalyx, Desmodium macrocaprum, and Cerbera dumicola*.
- Woodlands may be subject to clearing/thinning for pasture development with disturbed areas being subject to invasion by weeds.

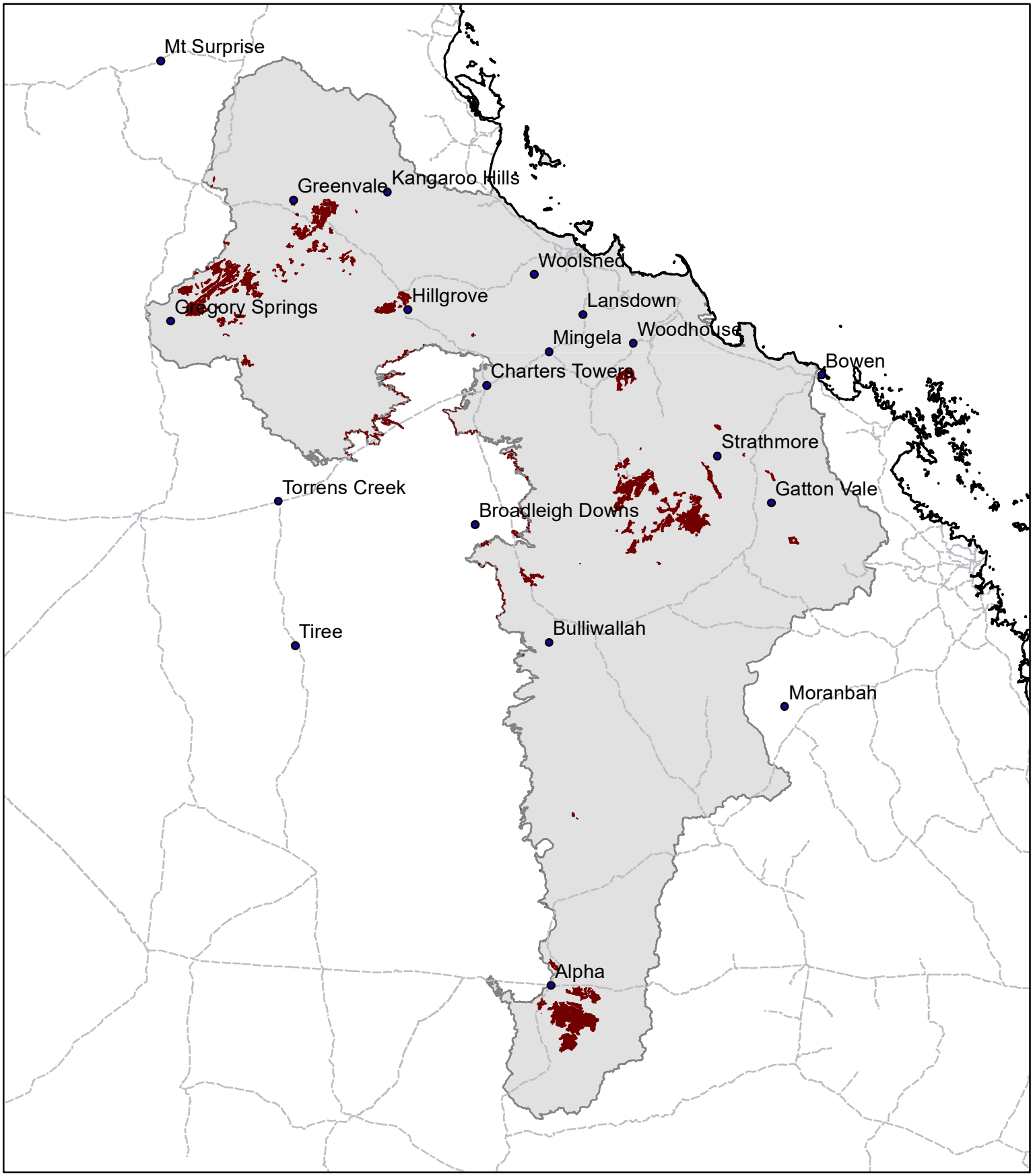
Regional Ecosystems

9.5.4, 9.11.19, 9.12.28, 10.5.5a, 11.8.4, 11.11.12, 11.12.8, 11.12.8a, 11.12.8b.

Land units; Agricultural management unit; Soil associations

Land units (Gunn *et al* 1967; Story *et al* 1967) Peak Vale 2, Craven 1, Hope 2, Rutland 3, Moorooloo 1, Cotherstone 3, Hillalong 1; AMU (DPI 1993) Duckponds, Highlands; Soil Associations (Burgess 2003) Mayfair, Red-one; Soil Associations (Rogers *et al* 1999) Boston, Burra, Ceaser, Conolly, Corea, Greenvale, Nosnillor, Rangeside, Rishton, Wattle Vale.

BD18 Silver-leaved ironbark



Area of land type in region: 2%
Median rainfall (region): 440 – 981 mm
Average rainfall (region): 476 – 1112 mm
Area of land type with FPC: 72%
Median FPC: 15%
Median TBA: 6 m2/ha

Queensland Government

Softwood scrub

Landform	Undulating plains and tablelands.
Woody vegetation	Wilga, bottletree, bauhinia and Crow's ash, acacia and other softwood scrub species. Understorey of croton, holly bush, lolly bush and currant bush.
Expected pasture composition	*In an uncleared state, there is little grass.* ** Denotes non-native "Expected Pasture Composition" species*
Preferred	Buffel grass*, urochloa*.
Intermediate	Brigalow grass.
Non-preferred	Lovegrasses.
Common forbs	Non-preferred species include jack bean.
Suitable sown pastures	Buffel grass, green panic, urochloa, creeping bluegrass, Rhodes grass, butterfly pea, leucaena, Shrubby stylo, Caribbean stylo, Caatinga stylo.
Introduced weeds	Parthenium, lantana, rubbervine, chinee apple, bellyache bush.
Soil	Brown clays (vertosols, chromosols), deep red clays (ferrosols) and deep red earths (kandosols) and earthy sands (tenosols).
Description	***Surface*:** Weak self-mulching, scattering of stone (brown clays), or friable (red clays), or sands (red earths). ***Surface texture***: light to medium clay (brown clays), clay loam to light clay (red clays) to sands (red earths); ***Subsoil texture*:** medium clay except deep sands.
Water availability	Low (deep sands) to high (brown clays).
Rooting depth	Between 30 to 90 cm (brown clays) to >1 m (red clays).
Fertility	Low to moderate.

Salinity

Nil (red clays), low (brown clays).

Sodicity

Non-sodic

pH

Strongly alkaline (brown clays) to acid (deep sands).

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 553 – 748 mm				
Pasture type	Median tree cover (TBA m^2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	2640 - 4810	30%	3.3 - 3.7
	14 TBA 34 FPC	660 - 2220	30%	12 – 15
Buffel	0 TBA/FPC	4170 - 7300	35%	1.1 – 2.0

Enterprise

Finishing

Land use and management recommendations

- Most areas of softwood scrub have been cleared and established to improved pastures in the south; remnant areas are present in the north.
- Maintain vegetation belts for wildlife habitats and corridors.
- Lantana, rubbervine, chinee apple and bellyache bush need to be controlled using a combination of herbicides and fire in sown pastures, or targeted use of herbicides in remnant areas.
- Groundwater recharge areas

Land use limitations

- Regrowth of some species.
- Surface sealing soils.
- Limited soil erosion hazard. Prone to sheet, rill and gully erosion along tracks and fence lines and on sloping lands.

Conservation features and related management

- Much of these softwood scrub communities have been extensively cleared for cropping and grazing. Remnant areas provide regional refugia for a wide diversity of flora and fauna species, some species with disjunct distributions.
- Habitat for rare and threatened flora species including *Fontainea fugax*, *Macropteranthes leiocaulis*, *Pomaderris clivicola* and *Cadellia pentastylis.*
- Some communities include caves that support specialised flora and fauna (particularly bats that use the caves for breeding). The rare species *Alectryon tropicus* and *Atalaya calcicola* are associated with these communities.
- Remnants are subject to invasion by weeds.

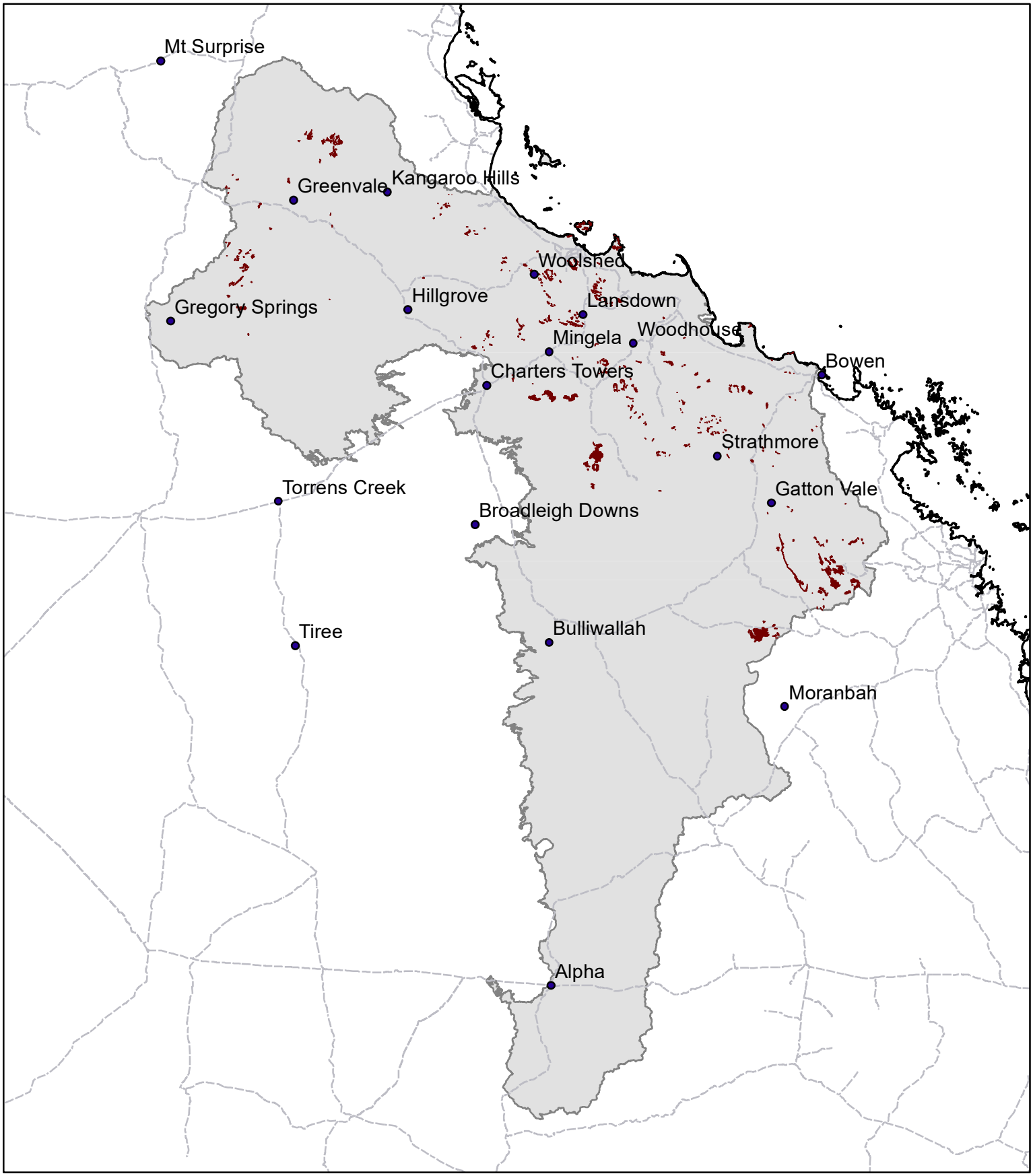
Regional Ecosystems

2.5.21, 2.9.3a, 7.12.11c, 7.12.13, 7.12.46a-b, 7.12.47a-b, 7.12.48, 7.12.49, 7.12.50, 9.11.8a-b, 9.11.9, 9.12.34, 9.12.8a-b, 9.5.2, 9.8.3, 9.8.7, 11.3.11x1, 11.5.15, 11.7.1x1, 11.9.4a.

Land units; Agricultural management unit; Soil associations

Land units (Gunn *et al* 1967; Story *et al* 1967) Cungelella 2 & 3, Kareela 2, Wharton 2, Bedourie 3, Racecourse 1; AMU (DPI 1993) Duckponds, Glen Idol. Soil Associations (Rogers *et al* 1999) Pentland, Limeview, Rangeside, Rishton.

BD19 Softwood scrub



Area of land type in region: 1%
Median rainfall (region): 440 – 981 mm
Average rainfall (region): 476 – 1112 mm
Area of land type with FPC: 81%
Median FPC: 34%
Median TBA: 14 m2/ha

Queensland Government

Yellowjacket with other eucalypts

Landform	Plains and hillslopes.
Woody vegetation	Yellowjacket woodland with associated species of bloodwood (e.g. rough-leaved) and Darwin woollybutt. Understorey, if present, of wattles, grevilleas, quinine, soap tree, heartleaf poison bush.
Expected pasture composition	** Denotes non-native "Expected Pasture Composition" species*
Preferred	Soft spinifex, black speargrass, silky umbrella grass, hairy panic, giant speargrass, cotton panic, kangaroo grass, plume sorghum, golden beard grass.
Intermediate	Silky oil grass, rat's tail grass, poverty grass.
Non-preferred	Wiregrasses (particularly jericho, dark), wanderrie grass, buck spinifex, bottlewasher grasses, lovegrasses, five-minute grass, flannel weeds.
Annuals	Fire grass, small burr grass. Kerosene grass (non-preferred).
Common forbs	Non-preferred species include flannel weeds.
Suitable sown pastures	Not suitable for sown pastures. Oversow natives with shrubby stylo.
Introduced weeds	
Soil	Deep red earths.
Description	***Surface*:** Loose; ***Surface texture*:** sandy loam; ***Subsoil texture*:** light clay.
Water availability	Low to moderate.

Fertility: Low

Salinity: Non-saline

Sodicity: Non-sodic

pH: Slightly acid to 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 502 – 624 mm				
Pasture type	Median tree cover (TBA m^2/ha) (FPC %)	Median annual pasture growth (DM kg/ha)	Safe annual utilisation pasture growth (%)	LTCC (ha/AE)
Native species	0 TBA/FPC	1360 - 1850	20%	8 - 11
	10 TBA 25 FPC	470 - 800	20%	18 – 31

Enterprise

Breeding

Land use and management recommendations

- Rotational wet seasons spelling to maintain perennial pasture composition.
- Whoa boys are required on roads/tracks to control erosion.
- Use fire to maintain preferred pasture composition and suppress woody species.
- Maintain at least 50% ground cover at end of dry season to maximise infiltration and reduce soil erosion.

Land use limitations

- Heartleaf poison bush.
- Limited soil erosion hazard. Prone to sheet, rill and gully erosion along tracks and fence lines and on sloping lands.

Conservation features and related management

- These woodlands provide habitat for arboreal mammals.
- A number rare flora species are associated with these communities including *Acacia ramiflora, A. spania, Aristida burraensis, Melaleuca chisholmii* and *Eucalyptus quadricostata*.

Regional Ecosystems

2.5.20, 9.5.1, 9.7.5, 9.7.6, 9.10.1a-b, 9.10.4, 9.10.5a-c, 9.10.7a, 9.11.21, 9.12.35, 9.5.1, 9.7.5, 9.7.6, 10.5.1c, 11.11.15c, 11.11.15d.

Land units; Agricultural management unit; Soil associations

Land units (Gunn *et al* 1967) Ronlow 1, Tichbourne 2; Soil Associations (Rogers *et al* 1999) Pentland, Rishton.

BD20 Yellowjacket with other eucalypts

Area of land type in region: 0.2%
Median rainfall (region): 440 – 981 mm
Average rainfall (region): 476 – 1112 mm
Area of land type with FPC: 92%
Median FPC: 25%
Median TBA: 10 m2/ha

Queensland Government