

Darling Downs Region Plant Index

Common name	Scientific name	Page
African boxthorn *	<i>Lycium ferocissimum</i>	DD02, DD03, DD04, DD05, DD08, DD09, DD10, DD11, DD12, DD14, DD15
African lovegrass*	<i>Eragrostis curvula</i>	DD06, DD07, DD11, DD12, DD13, DD15, DD16, DD17
Angleton bluegrass	<i>Dichanthium aristatum</i> cvv. Floren, Swann	DD04, DD05, DD10
Bambatsi*	<i>Panicum coloratum</i> var. <i>makarikariense</i>	DD02, DD04, DD05, DD10, DD12, DD13
barbwire grass	<i>Cymbopogon refractus</i>	DD01, DD06, DD07, DD08, DD09, DD10, DD11, DD12, DD15, DD16, DD17
barrel medic*	<i>Medicago truncatula</i>	DD01, DD02, DD04, DD05, DD08, DD09, DD10, DD12, DD13, DD14, DD15, DD17
beetle grass	<i>Leptochloa fusca</i>	DD05, DD06
belah	<i>Casuarina cristata</i>	DD01, DD04, DD05, DD12, DD13, DD15
Biserrula*	<i>Biserrula pelecinus</i>	DD07, DD17
Bisset creeping bluegrass see creeping bluegrass *		
bitterbark	<i>Alstonia constricta</i>	DD15
black bean	<i>Castanospermum australe</i>	DD03
black speargrass	<i>Heteropogon contortus</i>	DD03, DD06, DD11, DD12, DD14, DD15
black tea tree	<i>Melaleuca bracteata</i>	DD04, DD05
blackberry*	<i>Rubus anglocandicans</i>	DD07
blackbutt	<i>Eucalyptus pilularis</i>	DD03
blady grass	<i>Imperata cylindrica</i>	DD03, DD07
blue couch	<i>Cynodon incompletus</i>	DD03
blue crowfoot	<i>Erodium crinitum</i>	DD02, DD09, DD10, DD12
blue gum see Queensland blue gum	<i>Eucalyptus tereticornis</i>	
bluebells	<i>Hyacinthoides</i> spp.	DD07
blue-leaved ironbark	<i>Eucalyptus fibrosa</i> subsp. <i>nubila</i>	DD16, DD17

Common name	Scientific name	Page
bottle tree	<i>Brachychiton rupestris</i>	DD01, DD08, DD15
bottleshrub grasses	<i>Enneapogon</i> spp.	DD06
bracken fern	<i>Pteridium esculentum</i>	DD07
brigalow	<i>Acacia harpophylla</i>	DD01, DD04, DD05, DD15
brigalow grass	<i>Paspalidium caespitosum</i>	DD01, DD04, DD05, DD08, DD09, DD10
broad-leaved ironbark	<i>Eucalyptus fibrosa</i> subsp. <i>fibrosa</i>	DD16, DD17
broad-leaved red see broad-leaved ironbark		FT07, FT10, FT22
broad-leaved stringybark	<i>Eucalyptus caliginosa</i>	DD07
Brunswick grass*	<i>Paspalum nicorae</i>	DD07
budda pea	<i>Aeschynomene indica</i>	DD05
buffel grass*	<i>Pennisetum ciliare</i> (formerly <i>Cenchrus ciliaris</i>)	DD01, DD05, DD06, DD11, DD15
bulloak	<i>Allocasuarina luehmannii</i>	DD06, DD11, DD12
bunya pine	<i>Araucaria bidwillii</i>	DD03
button medic*	<i>Medicago orbicularis</i>	DD01, DD02, DD04, DD05, DD12, DD13, DD14, DD15
Caatinga stylo*	<i>Stylosanthes seabrana</i>	DD01, DD04, DD05, DD08, DD09, DD10, DD13, DD15
Caley's ironbark	<i>Eucalyptus caleyi</i>	DD07
Chilean needle grass*	<i>Nassella neesiana</i>	DD06
chloris grasses	<i>Chloris</i> spp.	DD16
climbing saltbush	<i>Chenopodium nutans</i>	DD04, DD13
cluster clover*	<i>Trifolium glomeratum</i>	DD17
cocksfoot	<i>Dactylis glomerata</i>	DD03
comb chloris	<i>Chloris pectinata</i>	DD10
common fringe-rush	<i>Fimbristylis dichotoma</i>	DD11
Coolatai grass*	<i>Hyparrhenia hirta</i>	DD17
coolibah	<i>Eucalyptus coolabah</i>	DD02

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copperburrs	<i>Sclerolena</i> spp.	DD01, DD05
cotton panic	<i>Digitaria brownii</i>	DD08, DD09
cottonbush*	<i>Gomphocarpus physocarpus</i>	DD12, DD14, DD15, DD16
cottontails*	<i>Froelichia floridana</i>	DD06
creeping bluegrass	<i>Bothriochloa insculpta</i> cv. Bisset	DD01, DD02, DD03, DD04, DD05, DD08, DD09, DD10, DD12, DD13, DD14, DD15
crow's ash	<i>Flindersia australis</i>	DD03, DD15
cudweeds	<i>Gnaphalium</i> spp.	DD07
curly Mitchell grass	<i>Astrebla lappacea</i>	DD02
curly windmill grass	<i>Enteropogon acicularis</i>	DD01, DD04, DD05, DD08, DD09, DD10, DD11, DD16
current bush	<i>Carissa ovata</i>	DD01, DD15
Cypress pine	<i>Callitris glaucophylla</i>	DD06, DD08, DD11, DD16, DD17
dainty lovegrass	<i>Eragrostis microcarpa</i>	DD01, DD11
dark wiregrass	<i>Aristida calycina</i>	DD01, DD06, DD09, DD10, DD11, DD17
desmanthus	<i>Desmanthes species</i>	DD01, DD02, DD04, DD05, DD10, DD13, DD15
desmodium	<i>Desmodium</i> spp.	DD17
digit grass*	<i>Digitaria eriantha</i>	DD06, DD07, DD08, DD09, DD11, DD12, DD14, DD15, DD16, DD17
dog burr	<i>Sclerolaena tetracuspis</i>	DD01, DD04, DD05
dusky-leaved ironbark see blue-leaved ironbark		FT01, FT02, FT04, FT05, FT06, FT11, FT15, FT19, FT20, FT21, FT22, FT23, FT30
early spring grass	<i>Eriochloa pseudoacrotricha</i>	DD01, DD03, DD04, DD05, DD08, DD09, DD10
emu apple	<i>Owenia acidula</i>	DD01
emu foot	<i>Psoralea tenax</i>	DD02, DD12
fairy grass	<i>Sporobolus caroli</i>	DD01, DD05, DD11, DD12, DD13
false sandalwood	<i>Eremophila mitchellii</i>	DD01, DD05, DD11, DD12
feathertop wiregrass	<i>Aristida latifolia</i>	DD02, DD13

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fescue	<i>Festuca arundinacea</i>	DD03, DD07
five-minute grass	<i>Tripogon loliiformis</i>	DD11, DD13, DD17
flooded gum	<i>Eucalyptus grandis</i>	DD03
forest bluegrass	<i>Bothriochloa bladhii</i>	DD03, DD04, DD05, DD06, DD08, DD09, DD10, DD11, DD12, DD13, DD14, DD15
forest bluegrass	<i>Bothriochloa bladhii</i> ssp. <i>glabra</i> cv. Swann	DD17
forest hedgehog grass see hedgehog grass		FT06, FT24
foxtail	<i>Pennisetum villosum</i>	DD03, DD08, DD09
fuzzy box	<i>Eucalyptus conica</i>	DD02, DD17
galvanised burr	<i>Sclerolaena birchii</i>	DD01, DD04, DD05, DD12, DD13
Gatton panic	<i>Panicum maximum</i>	DD01, DD02, DD03, DD04, DD05, DD08, DD09, DD10, DD12, DD13, DD14, DD15
giant rats tail grass*	<i>Sporobolus pyramidalis</i>	DD11, DD12
giant stinging tree	<i>Dendrocnide excelsa</i>	DD03
glycine	<i>Glycine</i> spp.	DD03, DD10, DD15, DD17
glycine pea	<i>Glycine tabacina</i>	DD03
golden beard grass	<i>Chrysopogon fallax</i>	DD06, DD11, DD12, DD13, DD16
grass tree	<i>Xanthorrhoea</i> spp.	DD08
green couch	<i>Cynodon dactylon</i>	DD02, DD04, DD05, DD08, DD09, DD10, DD11, DD12, DD15
green panic	<i>Panicum maximum</i> var. <i>trichoglume</i>	DD03, DD04, DD08, DD09, DD10, DD12, DD15
grey box	<i>Eucalyptus microcarpa</i>	DD07, DD12, DD17
grey lovegrass	<i>Eragrostis cilianensis</i>	DD11
gum-topped box	<i>Eucalyptus moluccana</i>	DD07, DD11
hairy panic	<i>Panicum effusum</i>	DD07, DD11, DD12, DD17
hare's foot clover*	<i>Trifolium arvense</i>	DD17

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harrisia cactus*	<i>Harrisia martini</i>	DD01, DD06, DD11, DD12, DD16
hedgehog grass	<i>Echinopogon ovatus</i>	DD17
hoop Mitchell grass	<i>Astrebla elymoides</i>	DD02
hoop pine	<i>Araucaria cunninghamii</i>	DD03
inland grey box see grey box		
ironwood	<i>Acacia excelsa</i>	DD15
Jericho wiregrass	<i>Aristida jerichoensis</i>	DD06, DD11
kangaroo grass	<i>Themeda triandra</i>	DD03, DD07, DD10, DD11, DD12, DD14
kangaroo oats see native oats		
kikuyu*	<i>Pennisetum clandestinum</i>	DD03
lantana*	<i>Lantana camara</i>	DD03, DD08, DD09, DD10, DD11, DD15
leucaena*	<i>Leucaena leucocephala</i>	DD04, DD05, DD10, DD13, DD15
limebush	<i>Citrus glauca</i>	DD01, DD04, DD05
limestone bottlewasher	<i>Enneapogon polyphyllus</i>	DD09, DD10, DD12, DD13, DD16
lippia*	<i>Phyla canescens</i>	DD01, DD02, DD03, DD05, DD11, DD12, DD13
liverseed grass*	<i>Urochloa panicoides</i>	DD02
lovegrasses see also weeping, dainty and purple	<i>Eragrostis</i> spp.	DD06
lucerne	<i>Medicago sativa</i>	DD01, DD02, DD03, DD04, DD08, DD10, DD12, DD13, DD14, DD15, DD17
malvastrum	<i>Malvastrum</i> spp.	DD09, DD10
many-headed wiregrass	<i>Aristida caput-medusae</i>	DD01, DD06, DD07, DD09, DD11, DD12, DD16, DD17
matrush	<i>Lomandra</i> spp.	DD16
Mayne's pest	<i>Verbena aristigera</i>	DD09
medics* see barrel, button, spineless burr	<i>Medicago</i> spp.	

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Mitchell grass see also hoop and curly Mitchell grasses	<i>Astrebla</i> spp.	DD01
Moreton Bay ash	<i>Corymbia tessellaris</i>	DD06, DD09, DD10, DD12
mother-of-millions *	<i>Bryophyllum delagoense</i>	DD01, DD02, DD03, DD04, DD05, DD08, DD09, DD10, DD11, DD12, DD13, DD15
mountain coolibah	<i>Eucalyptus orgadophila</i>	DD03, DD08, DD09, DD10
Mueller's saltbush	<i>Atriplex muelleri</i>	DD01, DD04, DD05
mugga ironbark	<i>Eucalyptus sideroxylon</i>	DD17
mulga fern	<i>Cheilanthes sieberi</i>	DD11, DD12, DD16
myall	<i>Acacia pendula</i>	DD01, DD12
nardoo	<i>Marsilea drummondii</i>	DD02, DD12, DD13
narrow-leaved ironbark	<i>Eucalyptus crebra</i>	DD07, DD08, DD09, DD11, DD14, DD15, DD16, DD17
native couch see green and blue couch		
native indigo	<i>Indigofera linifolia</i>	DD11
native millet	<i>Panicum decompositum</i>	DD02
native oats	<i>Themeda avenacea</i>	DD02, DD13
native olive	<i>Notelaea microcarpa</i>	DD08
native sensitive plant	<i>Neptunia gracilis</i>	DD02, DD11, DD12
New England blackbutt	<i>Eucalyptus andrewsii</i>	DD07
New Zealand spinach	<i>Tetragonia tetragonoides</i> formerly <i>T. expansa</i>	DD05
nipan	<i>Capparis lasiantha</i>	DD01
noogoora burr*	<i>Xanthium occidentale</i>	DD02
paspalum *	<i>Paspalum dilatatum</i>	DD02, DD03, DD05, DD07, DD17
peach bush	<i>Olearia elliptica</i>	DD15
phalaris*	<i>Phalaris aquatica</i>	DD03
pigweed	<i>Portulaca</i> spp.	DD12, DD13
pink bloodwood	<i>Corymbia intermedia</i>	DD03

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pinrush	<i>Juncus usitatus</i> L.A.S.Johnson	DD07
pitted bluegrass	<i>Bothriochloa decipiens</i>	DD02, DD03, DD04, DD05, DD06, DD07, DD08, DD09, DD10, DD11, DD12, DD13, DD14, DD15, DD16, DD17
plains grass	<i>Austrostipa aristiglumis</i>	DD02
plume grass	<i>Dichelachne</i> spp.	DD07
poplar box	<i>Eucalyptus populnea</i>	DD01, DD05, DD10, DD11, DD12, DD13, DD14, DD15, DD16
poverty grass	<i>Eremochloa bimaculata</i>	DD16
prickly pear*	<i>Opuntia inermis</i>	DD01, DD02, DD04, DD05, DD08, DD09, DD10, DD14, DD16, DD17
purple lovegrass	<i>Eragrostis lacunaria</i>	DD01, DD11, DD12, DD16
purple wiregrass	<i>Aristida ramosa</i>	DD06, DD11, DD12, DD13, DD17
Queensland blue gum	<i>Eucalyptus tereticornis</i>	DD02, DD06, DD08, DD12, DD13, DD14
Queensland bluegrass	<i>Dichanthium sericeum</i>	DD01, DD02, DD04, DD05, DD08, DD09, DD10, DD12, DD13, DD14, DD15, DD17
quinine*	<i>Petalostigma pubescens</i>	DD15
rat's tail grass	<i>Sporobolus elongatus</i>	DD02
ray grass	<i>Sporobolus actinocladus</i>	DD13
red cedar	<i>Toona ciliata</i>	DD03
red Natal grass*	<i>Melinis repens</i>	DD03
reedgrass	<i>Arundinella nepalensis</i>	DD02
Rhodes grass	<i>Chloris gayana</i> cvv. Callide, Katambora, Samford	DD02, DD03, DD04, DD05, DD06, DD08, DD09, DD10, DD11, DD12, DD13, DD14, DD15, DD16
rhynchosia	<i>Rhynchosia</i> spp.	DD09, DD10, DD15
rhynchosia pea	<i>Rhynchosia minima</i>	DD02, DD11, DD12
river red gum	<i>Eucalyptus camaldulensis</i>	DD02, DD13
rose clover	<i>Trifolium hirtum</i>	DD17

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rough speargrass	<i>Austrostipa scabra</i>	DD06, DD07, DD08, DD10, DD11, DD17
rough-barked apple	<i>Angophora floribunda</i>	DD02, DD06, DD09, DD12
round-leaved myrtle	<i>Psydrax odorata</i>	DD08
ruby saltbush	<i>Enchylaena tomentosa</i>	DD01, DD13
rusty gum	<i>Angophora leiocarpa</i>	DD06, DD11, DD16
ryegrass	<i>Lolium perenne</i>	DD07
Sally wattle	<i>Acacia salicina</i>	DD02, DD04, DD12
sandalwood	<i>Santalum spicatum</i>	DD04
satintop	<i>Bothriochloa erianthoides</i>	DD02, DD10
Scotch thistle*	<i>Onopordum acanthium</i>	DD02
scrub boonaree	<i>Alectryon diversifolius</i>	DD08
sedges	<i>Cyperus spp.</i>	DD05, DD07, DD09, DD10, DD13
serradella* see yellow serradella and slender serradella	<i>Ornithopus spp.</i>	
sesbania pea	<i>Sesbania cannabina</i>	DD05, DD13
shorthair plume grass	<i>Dichelachne micrantha</i>	DD17
shot grass	<i>Paspalidium globoideum</i>	DD02, DD05
sida	<i>Sida spp.</i>	DD16
silky browntop	<i>Eulalia aurea</i>	DD06, DD13
silver-leaved ironbark	<i>Eucalyptus melanophloia</i>	DD08, DD09, DD15
siratro *	<i>Macroptilium atropurpureum</i>	DD03
slender bamboo grass	<i>Austrostipa verticillata</i>	DD13, DD15, DD17
slender chloris	<i>Chloris divaricata</i>	DD02, DD03, DD05, DD13, DD14
slender panic	<i>Paspalidium gracile</i>	DD01
slender serradella*	<i>Ornithopus pinnatus</i>	DD07
slender tick trefoil	<i>Desmondium varians</i>	DD12

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small burrgrass	<i>Tragus australianus</i>	DD03, DD11
small Flinders grass	<i>Iseilema membranaceum</i>	DD02, DD13
soda bush	<i>Neobassia proceriflora</i>	DD01
soft roly poly	<i>Salsola kali</i>	DD01, DD05
southern spear grasses see also plains grass	<i>Austrostipa</i> spp.	DD02
spineless burr medic	<i>Medicago polymorpha</i>	DD01, DD05, DD08, DD09, DD10, DD13, DD14, DD17
spotted gum	<i>Corymbia citriodora</i> Syn. <i>Eucalyptus citriodora</i> subsp. <i>Variegata</i>	DD16
stinkgrass*	<i>Eragrostis cilianensis</i>	DD01, DD05
strangler fig	<i>Ficus watkinsiana</i>	DD03
stromonium	<i>Datura stramonium</i>	DD02
sub clover	<i>Trifolium subterraneum</i>	DD07, DD17
summer grass	<i>Digitaria</i> spp.	DD07
sundews	<i>Drosera</i> spp.	DD07
Sydney blue gum	<i>Eucalyptus saligna</i>	DD03
tall chloris	<i>Chloris ventricosa</i>	DD06, DD07, DD08, DD09, DD10, DD11, DD12, DD14
tall finger grass*	<i>Digitaria milianjiana</i> cv. <i>Strickland</i>	DD06
tallowwood	<i>Eucalyptus microcorys</i>	DD03
tea tree	<i>Melaleuca</i> spp.	DD02
thin-leaved stringybark	<i>Eucalyptus eugenioides</i>	
tiger pear*	<i>Optunia aurantianca</i>	DD02, DD03, DD05, DD06, DD08, DD09, DD10, DD11, DD12, DD13, DD14
tree pear*	<i>Optunia tormentosa</i>	DD01, DD02, DD03, DD04, DD05, DD06, DD07, DD08, DD09, DD10, DD11, DD12, DD13, DD14, DD15, DD16, DD17
trefoil	<i>Trifolium</i> spp.	DD09, DD10, DD15

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tumbledown gum	<i>Eucalyptus chlorocarpa</i>	DD06, DD07, DD17
twirly windmill grass	<i>Enteropogon ramosus</i>	DD02, DD12, DD13
umbrella canegrass	<i>Leptochloa digitata</i>	DD02, DD05
urochloa*	<i>Urochloa mosambicensis</i>	DD15
wallaby grass	<i>Austrodanthonia</i> spp.	DD02, DD04, DD07, DD17
Warrego summer grass	<i>Paspalidium jubiflorum</i>	DD05
wattle	<i>Acacia</i> spp.	DD03, DD08, DD11, DD16, DD17
weeping grass <i>see also</i> weeping panic	<i>Microlaena stipoides</i>	DD17
weeping lovegrass	<i>Eragrostis parviflora</i>	DD01, DD07
weeping panic	<i>Microlaena stipoides</i>	DD05
western rats-tail grass	<i>Sporobolus creber</i>	DD09, DD10, DD12
white box	<i>Eucalyptus albens</i>	DD08
white cedar	<i>Melia azedarach</i>	DD03
white clover*	<i>Trifolium repens</i>	DD02, DD03
white mahogany	<i>Eucalyptus acmenoides</i>	DD03
white speargrass	<i>Aristida leptopoda</i>	DD02, DD04, DD08, DD09, DD13
white stringybark <i>see also</i> thin-leaved stringybark	<i>Eucalyptus eugenioides</i>	DD03
whitewood	<i>Atalaya hemiglauca</i>	DD01
wild orange	<i>Capparis mitchellii</i>	DD01
wild rosemary	<i>Cassinia laevis</i>	DD08, DD17
wild tobacco tree*	<i>Solanum mauritianum</i>	DD03
wilga	<i>Geijera parviflora</i>	DD01, DD04, DD05, DD12, DD13, DD14, DD15
windmill chloris	<i>Chloris truncata</i>	DD02, DD04, DD17
windmill grass <i>see</i> windmill chloris	<i>Chloris truncata</i>	

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wiregrass/es	<i>Aristida</i> spp.	DD03, DD05, DD08, DD12, DD14, DD15
woodland lovegrass	<i>Eragrostis sororia</i>	DD01
woolly glycine	<i>Glycine tomentella</i>	DD03, DD06, DD11
woolly pod vetch	<i>Vicia villosa</i>	DD03, DD04, DD09, DD12, DD14
wynn cassia	<i>Chamaecrista rotundifolia</i> cv. Wynn	DD16
yabila grass	<i>Panicum queenslandicum</i>	DD02, DD09, DD10, DD14
yarran	<i>Acacia melvillei</i>	DD13
yellow box	<i>Eucalyptus melliodora</i>	DD08, DD17
yellow buttons	<i>Chrysocephalum apiculatum</i>	DD06, DD07
Yellow carbeen	<i>Sloanea woollsii</i>	DD03
yellow daisy burr	<i>Calotis lappulacea</i>	DD06
yellow serradella*	<i>Ornithopus compressus</i>	DD06, DD07
Youman's stringybark	<i>Eucalyptus youmannii</i>	DD07
zinnia*	<i>Zinnia peruviana</i>	DD08, DD09, DD10

* Denotes non-native species

Belah and brigalow on texture contrast soils



Landform	Level to gently undulating plains. Mostly found west of the Condamine River in the Darling Downs region.
Woody vegetation	Tall, open forests of belah with brigalow, and understorey of wilga and false sandalwood, myall and emu apple. Occasionally associated with bottle tree, nipan, whitewood, wild orange, currant bush and limebush.
Expected pasture composition	* Denotes non-native "Expected Pasture Composition" species.
Preferred	Brigalow grass, curly windmill grass and Queensland bluegrass.
Intermediate	Early spring grass, slender panic, fairy grass and barbwire grass.
Non-preferred	Lovegrasses (e.g. weeping, purple, dainty), many-headed wiregrass, dark wiregrass, purple lovegrass, liverseed grass* and stinkgrass*.
Common forbs and legumes	Mueller's saltbush, ruby saltbush and soda bush. Non-preferred species include copperburrs, galvanised burr, dog burr and soft roly poly.
Suitable sown pastures	Creeping bluegrass, Gatton panic, Rhodes grass (Katambora type) and buffel grass in western areas. Medics (barrel, button and spineless burr), lucerne, Caatinga stylo and desmanthus.
Introduced weeds	Prickly pear, tree pear, lippia, mother-of-millions and harrisia cactus.
Soil	Friable, shallow, black or brown texture-contrast soil (sodosol).
Description	Surface: Firm to hard-setting; Surface texture: clay loam; Subsoil texture: medium to heavy clay.
Water availability	Low to medium, plant available water capacity (PAWC) 50 – 140 mm.
Rooting depth	Low to medium; effective rooting depth 60 – 110 cm.
Fertility	Moderately fertile. Responds to nitrogen, phosphorus, zinc and occasionally copper.
Salinity	Non-saline or low salinity at the surface. Medium to very high salinity at depth (below 20 cm).

Sodicity
pH

Strongly sodic subsoils.
Neutral at surface, acid 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 580 – 632 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	8080 - 8700	30%	1.1 – 1.2
	10 TBA 25 FPC	5550 - 6770	30%	1.4 – 1.8
Sown			35%	

Enterprise

Growing and finishing.

Land use and management recommendations

- Undisturbed soils are generally well-structured and permeable, becoming prone to dispersion when exposed.
- Minimum tillage on these soils may improve the overall structure and friability of seedbeds.
- Deep tillage is not recommended. Soils below 0.5 – 1.0 m should be left undisturbed to reduce the possibility of exposing sodic and acid subsoils.
- Maximise ground cover, replace organic matter through long-term pasture phases, and adopting conservation tillage practices should minimise soil disturbance and improve seedbed conditions.
- Manage grazing pressure to maximise ground cover and to minimise the risk of erosion of dispersive soils.

Land use limitations

- The main limitations of these soils are the strongly sodic and highly to very highly saline deep subsoils – permeability decreases with depth as the subsoil sodicity increases.
- These limitations restrict water movement and root growth, particularly in flat situations.
- Exposure of subsoils may cause problems with dispersion and acidity.
- The risk of erosion increases on the slopes.
- The hardsetting surface restricts infiltration.

Conservation features and related management

- Extensively cleared or thinned for cropping and pasture, with remaining brigalow and/or belah or other understorey species (e.g. *Acacia*) often forming small clumps or tree lines.
- As appreciable areas of native pastures or natural dense woodlands are rare, these clumps and tree lines of brigalow and/or belah are managed primarily as conservation reserves.
- Habitat for rare and threatened species including the nomadic painted honeyeater *Grantiella picta*. This species feeds on mistletoe fruits that grow on eucalypts and acacias.
- These communities are considered sensitive to fire.

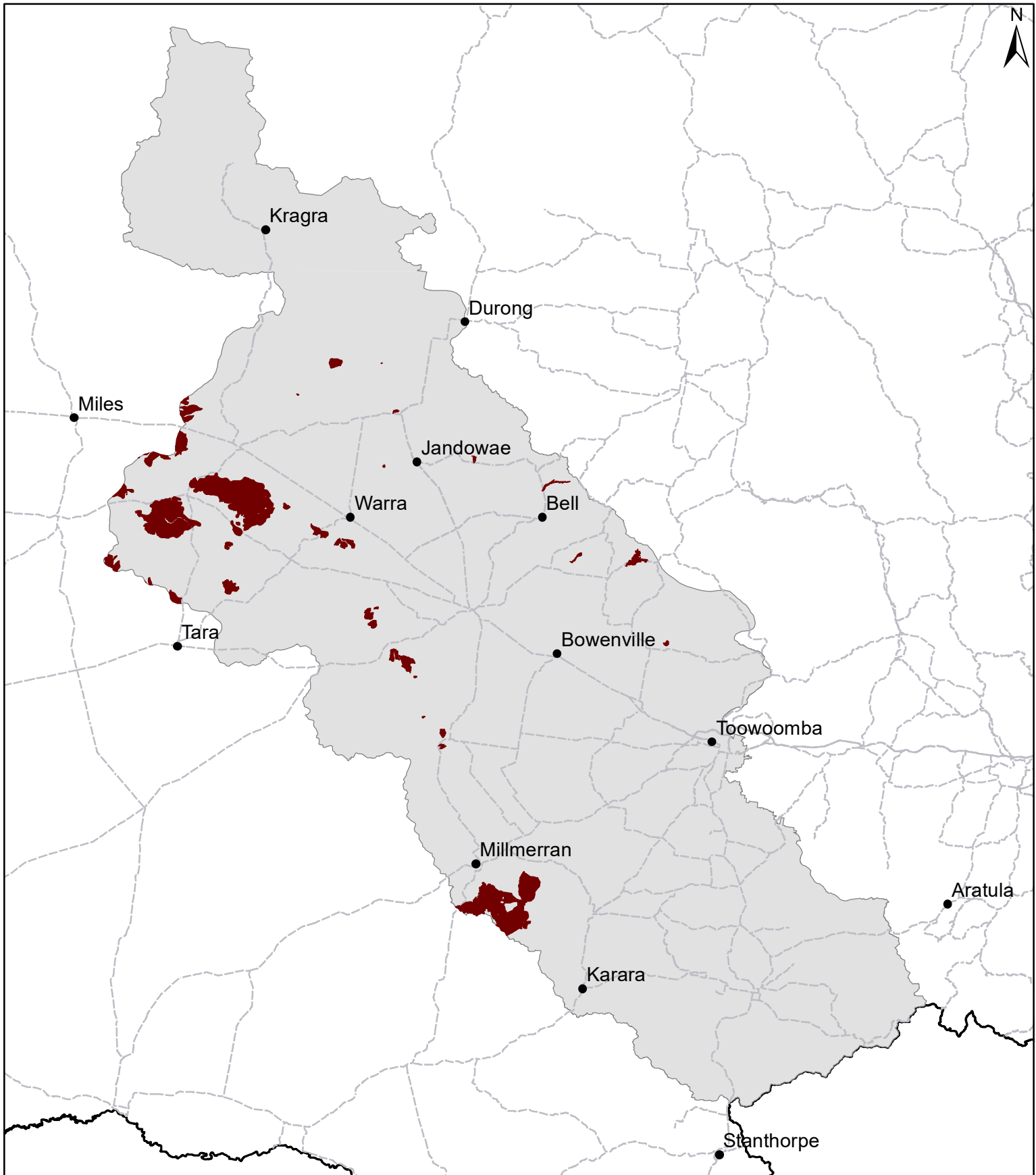
Regional Ecosystems

11.4.3, 11.4.3a, 11.4.3b

Land units; Agricultural management unit; Soil associations

Central Darling Downs Land Management Manual: 6d (*Arden, Calingungee, Kurrumbul, Moruya, Murra Cul Cul, Tandawanna*); Understanding Soils in the Murilla, Tara and Chinchilla: 5a, 5b (*Ulimaroa*).

DD01 Belah and brigalow on texture contrast soils



Area of land type in region: 2%
Median rainfall (region): 580 – 909 mm
Average rainfall (region): 585 – 927 mm
Area of land type with FPC: 12%
Median FPC: 25%
Median TBA: 10 m²/ha



Queensland
Government

Black soil plains and creek flats



Landform	Broad level plains of basaltic and sandstone alluvium. Gently sloping to flat alluvial plains associated with the Condamine River and tributaries, particularly on the flat valley floors and alluvial fans originating from the basaltic uplands.
Woody vegetation	Open grassland or Queensland blue gum and poplar box open woodland. Rough-barked apple and fuzzy box may also occur. Occasional river red gum, coolibah, sally wattle and tea tree along drainage lines.
Expected pasture composition	* Denotes non-native "Expected Pasture Composition" species.
Preferred	Queensland bluegrass, kangaroo oats (native oats), Mitchell grass (hoop, curly), satintop, wallaby grass, shot grass and paspalum*.
Intermediate	Small Flinders grass, pitted bluegrass, native millet, twirly windmill grass, windmill chloris and slender chloris. Reedgrass and umbrella canegrass along drainage lines – important bank stabilisers and sediment filters.
Non-preferred	Feathertop wiregrass, white speargrass, green couch, yabila grass, rat's tail grass, southern speargrasses (e.g. plains grass).
Common forbs and legumes	Blue crowfoot, rhynchosia pea, emu foot, native sensitive plant, glycine pea and nardoo.
Suitable sown pastures	Bambatsi, Gatton panic, creeping bluegrass (Bisset), kikuyu in waterways. Lucerne, medics (barrel and button), desmanthus and white clover in higher rainfall areas.
Introduced weeds	African boxthorn, tree pear, tiger pear, prickly pear, lippia, mother-of-millions, stromonium, noogoora burr and scotch thistle.
Soil	Deep to very deep, grey to dark grey cracking clays of mixed basalt/sandstone alluvium (vertisol).
Description	Surface: Weakly structured or coarse blocky, self-mulching; Surface texture: sandy light clay to heavy clay; Subsoil texture: medium heavy to heavy clay.
Water availability	High to very high; plant available water capacity (PAWC) 150 – >250 mm in root zone.
Rooting depth	Effective rooting depth 150–170 cm.
Fertility	Low to moderate organic Carbon, low Nitrogen; high available Phosphorus, low zinc.

Salinity
Sodicity
pH

Low to moderate at the surface; moderate to very high saline subsoils.
Non-sodic at surface; sodic or strongly sodic subsoils.
Mildly alkaline at the surface; strongly 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 582 – 729 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	4270 - 5430	30%	1.8 – 2.3
	13 TBA 31 FPC	1550 - 3510	30%	2.8 – 6.3
Sown			35%	

Enterprise

Growing and finishing.

Land use and management recommendations

- Grassed waterways should be maintained to provide ideal flow conditions and avoid erosion or excessive siltation. Maintaining effective ground cover and conservative stocking practices (spelling pastures in the growing season, flexible stocking rates) are important to reduce runoff and minimise the risk of sheet, rill and wind erosion.

Land use limitations

- Creek flats are very prone to overgrazing if animals can't be isolated from the creek country (even if they can access other country).
- Heavy, sticky clay makes the land type unsuitable for livestock during wet conditions.
- Creek flats are typically the coldest part of the landscape and frost in winter. While herbage growth is often good along the creek flats, cattle generally seek refuge in timbered country, if available.
- This land type is subject to periodic erosive flooding both in outlet areas and on the plains. Incorrectly located roads and fences often concentrate flows and cause serious gullying which is then difficult to stabilise.
- Alluvial loamy soils are prone to compaction (cracking and swelling will aid repair), structural and fertility decline.

Conservation features and related management

- Widely cleared for cultivation, and extensively used for cropping and pasture.
- Grasslands contain species at their distribution limits (e.g. eastern-most occurrence of Mitchell grasses; northern limits of wallaby and southern speargrasses). Habitat for a number of rare and threatened flora species (austral toadflax, native thistle, native hawk weed, lobed bluegrass, finger panic grass).
- The woodlands are an important habitat for arboreal mammals and birds.
- The productivity and values to wildlife and health of these areas can be enhanced through the use of soil conservation techniques to minimise soil erosion; and maintaining of connected timbered areas that can provide shelter for crops and stock, and protection for banks from slumping and act as floodwater filters.

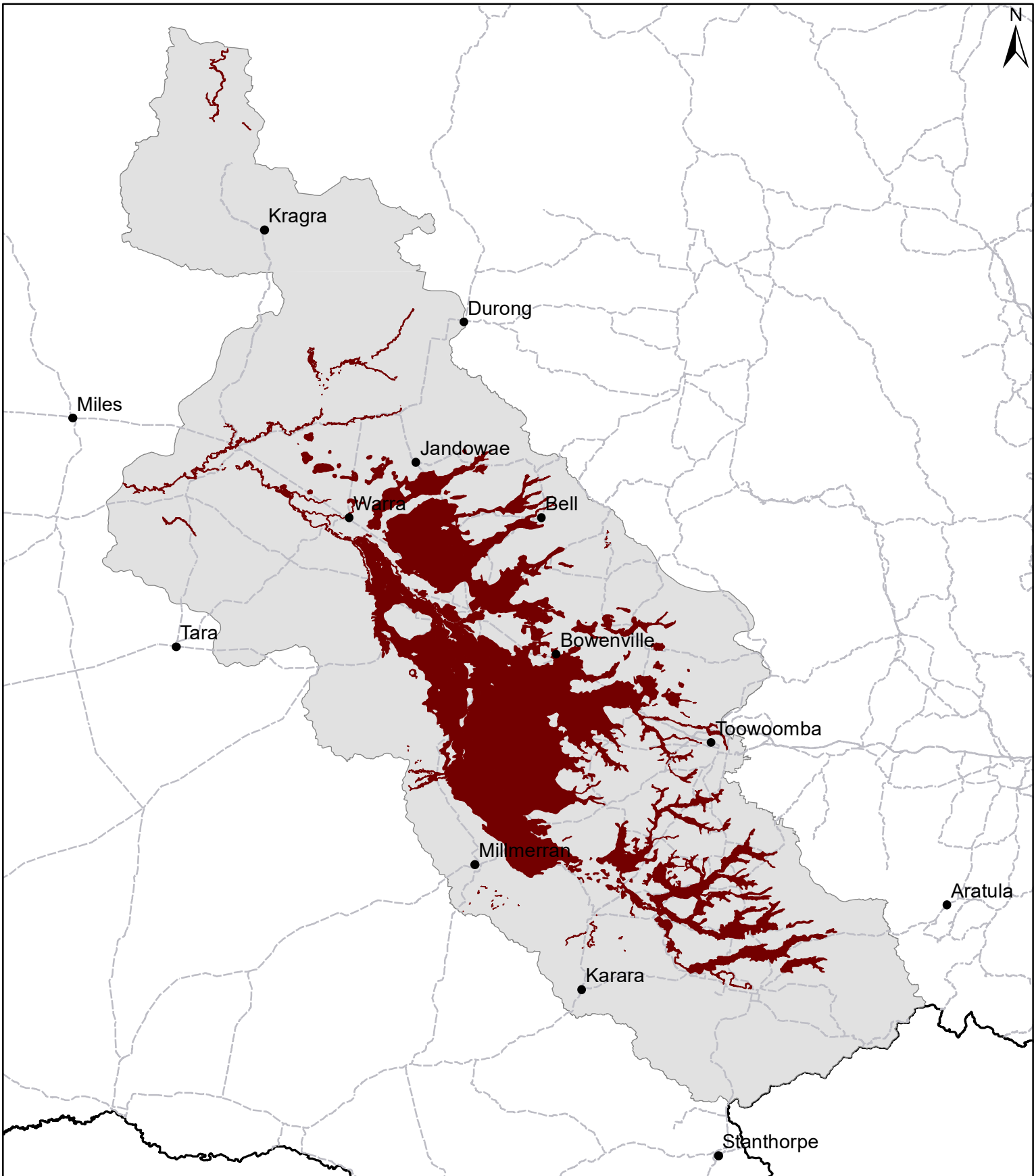
Regional Ecosystems

11.3.17, 11.3.2, 11.3.21, 11.3.25, 11.3.27c, 11.3.27d, 11.4.4

Land units; Agricultural management unit; Soil associations

Central Darling Downs Land Management Manual: 1a, 1b, 2a (*Anchorfield, Condamine, Mywybilla, Waco, Yargullen*); Understanding and Managing Soils in the Murilla, Tara and Chinchilla Shires: 1a, 1b (*Condamine*). Stanthorpe Rosenthal Field Manual: Mixed basalt alluvial plains (*Pratten*). Land Inventory and Technical Guide Eastern Downs Area: (*Anchorfield, Condamine, Mywybilla, Norillee, Turner, Waco, Yargullen*); Description and Management of the Soils of the Eastern Darling Downs Queensland: (*Waco, Calc. subsoil*).

DD02 Black soil plains and creek flats



Area of land type in region: 16%
Median rainfall (region): 580 – 909 mm
Average rainfall (region): 585 – 927 mm
Area of land type with FPC: 6%
Median FPC: 31%
Median TBA: 13 m²/ha



Queensland
Government

Blue gum, white stringybark and blackbutt on red clay



Landform	Gently undulating plains to undulating rises on the Toowoomba and Pechey Plateaus. Isolated areas on the Bunya Mountains and Main Range in the southern Downs.
Woody vegetation	Sydney blue gum, tallowwood, mountain coolibah, white stringybark, white mahogany, pink bloodwood and blackbutt open forest with a wattle understorey. Mixed rainforest with crow's ash, hoop and bunya pines, black bean, yellow carbeen, red and white cedars, strangler figs, giant stinging tree found throughout the greater rainfall areas of Bunya Mountains and Main Range near Killarney. Flooded gum occurs along watercourse and rainforest margins. Original vegetation largely cleared.
Expected pasture composition	* Denotes non-native "Expected Pasture Composition" species.
Preferred	Forest bluegrass, kangaroo grass, black speargrass and paspalum*.
Intermediate	Pitted bluegrass, early spring grass and red Natal grass*.
Non-preferred	Blady grass, slender chloris, blue couch, wiregrasses, foxtail and small burrgrass.
Common forbs and legumes	Glycine pea and woolly glycine.
Suitable sown pastures	Green panic, Gatton panic, creeping bluegrass (Bisset), Rhodes (Katambora, Callide and Samford types), kikuyu, paspalum, phalaris, fescue, cocksfoot. Lucerne, white clover, siratro and woolly pod vetch.
Introduced weeds	Lantana, African boxthorn, tree pear, tiger pear, mother-of-millions, wild tobacco tree and lippia.
Soil	Moderately deep (50 – 100 cm) to very deep (100 – 200 cm) non-cracking red-brown to red clays over basalt on the Toowoomba Plateau (ferrosol).
Description	Surface: Occasionally a few ironstone nodules; Surface texture: clay loam to light clay; Subsoil texture: light medium to heavy clay.
Water availability	Moderate to high; plant available water capacity (PAWC) 50 – 200 mm.
Rooting depth	Effective rooting depth 75 – 200 cm.
Fertility	Very high carbon and nitrogen, low to very high phosphorus. Responds to phosphorus and nitrogen fertilisation.

Salinity
Sodicity
pH

Low to very low.

Non-sodic.

Slightly acid (6.0) at surface; remaining slightly acid or becoming neutral (7.2) down the 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 628 – 729 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	2770 - 2770	30%	3.5 – 3.5
	17 TBA 40 FPC	620 - 1140	30%	8.5 – 16
Sown			35%	

Enterprise

Growing and finishing.

Land use and management recommendations

- Soils with loamy surfaces or finely structured clays are prone to wind erosion, particularly if landscape is open with little protective vegetation.
- Maintaining effective ground cover and conservative stocking practices (spelling pastures, flexible stocking rates) are important to reduce runoff and minimise the risk of sheet, rill and wind erosion.
- Using contour banks, grassed waterways and conservation cropping is needed to minimise runoff and soil erosion on more steeply sloping land (>1% slope).
- Fertilising with phosphorus and sulphur will improve pasture production.

Land use limitations

- Friable red non-cracking clays are prone to soil structural decline (compaction, hard-setting) that can lead to poor seedling establishment, difficult workability, reduced infiltration and increased wind and water erosion.
- Phosphorus fixing. Phosphorus is actively fixed by aluminium and iron in acid soils and by calcium in alkaline soils. Fixation is of less concern in alkaline than in acid soils.
- Generally, not suited to intensive livestock industries (e.g. feedlots, piggeries) due to the potential for contamination of groundwater supplies through the underlying fractured basalt.

Conservation features and related management

- The conservation status of these woodlands is 'of concern' with remnants providing important habitat for arboreal mammals and birds.
- A number of rare and threatened flora (Austral Toadflax, Australian anchor plant, native thistle, native hawk weed) are associated with this land type.
- Maintaining timbered areas can allow connectivity of remnants through habitat corridors and greatly increase the value of these areas of land to wildlife and the overall health of the system.
- Maintaining ground cover and use of conservation soil practices in these areas is important to minimise soil erosion and help protect the wildlife habitat.
- The rainforest areas on the fertile elevated plateaus have been extensively cleared and established with kikuyu.
- The remnants tend to be small and are threatened at the margins by weed invasion.

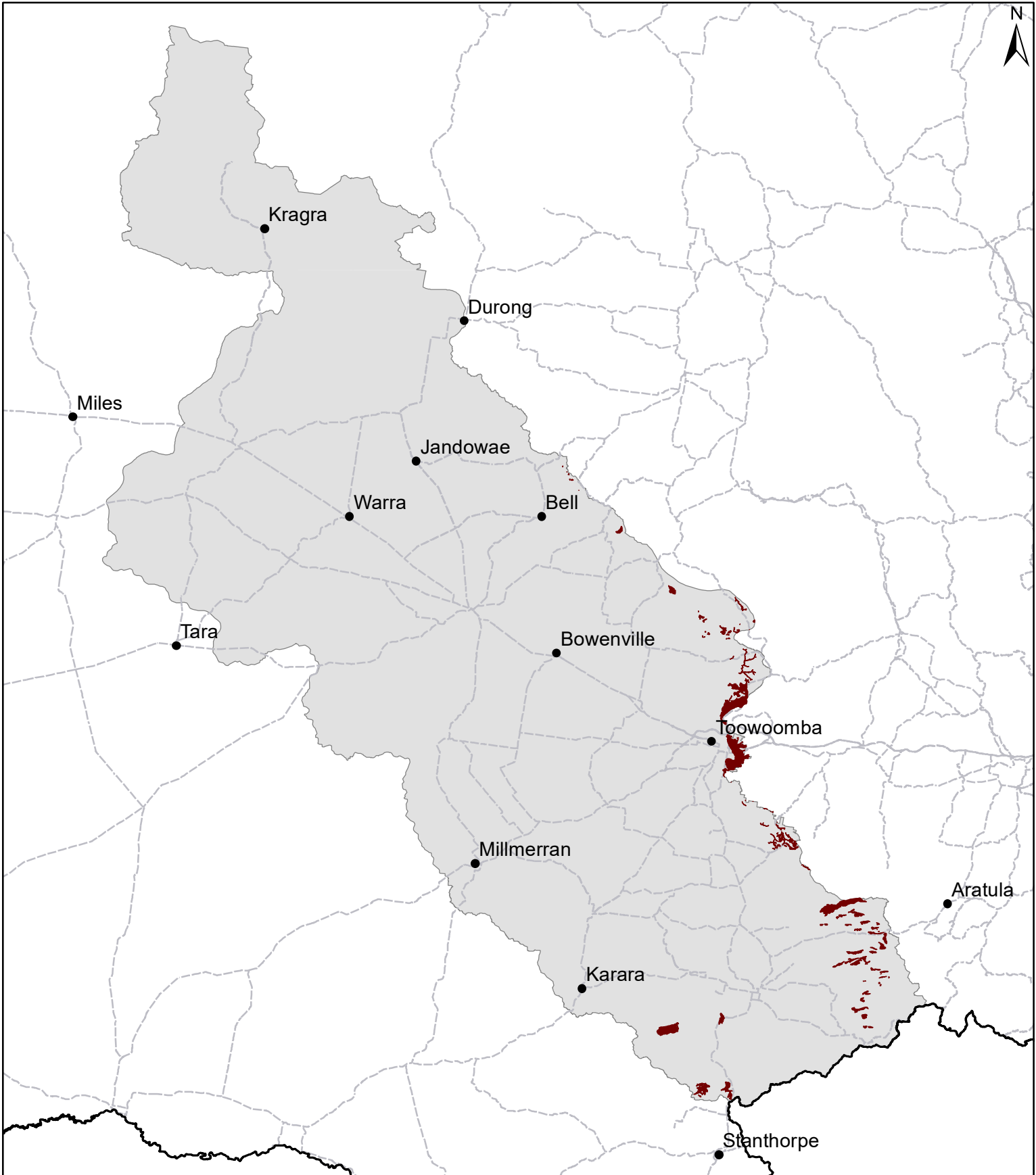
Regional Ecosystems

12.3.7, 12.5.6, 12.5.6a, 12.8.14, 12.9-10.17a, 13.12.8, 13.12.9

Land units; Agricultural management unit; Soil associations

Central Darling Downs Land Management Manual: 7d (Burton, Drayton, Ruthven, Middle Ridge, Toowoomba); Land Inventory and Technical Guide Eastern Darling Downs Area: (Burton, Drayton, Kynock, Middle Ridge, Ruthven, Toowoomba); Description and Management of the Soils of the Eastern Darling Downs Queensland: (Burton).

DD03 Blue gum, white stringybark and blackbutt on red clay



Area of land type in region: 1%
Median rainfall (region): 580 – 909 mm
Average rainfall (region): 585 – 927 mm
Area of land type with FPC: 66%
Median FPC: 40%
Median TBA: 17 m²/ha



Queensland
Government

Brigalow belah uplands



Landform	Gently undulating to steep low hills and rises.
Woody vegetation	Open forest of brigalow, belah and wilga with black tea tree and sally wattle along drainage lines. Associated with limebush, sandalwood and softwood scrub species. Poplar box and other eucalypts occasionally found on lighter soils.
Expected pasture composition	* Denotes non-native "Expected Pasture Composition" species.
Preferred	Wallaby grass, Queensland bluegrass and forest bluegrass.
Intermediate	Pitted bluegrass, curly windmill grass, windmill chloris, slender chloris, brigalow grass and early spring grass.
Non-preferred	Wiregrasses, white speargrass, green couch, slender bamboo grass.
Common forbs and legumes	Mueller's saltbush. Non-preferred species include dog and galvanised burrs.
Suitable sown pastures	Gatton panic, green panic, Bambatsi, creeping bluegrass, Rhodes (Katambora), Angleton bluegrass (Floren), lucerne, medics (barrel and button), leucaena, woolly pod vetch, Caatinga stylo and desmanthus.
Introduced weeds	African boxthorn, tree pear, prickly pear and mother-of-millions.
Soil	Moderately deep to deep (75–150 cm) grey-brown cracking clays, sometimes with brown sand and loams over brown clays, with shallow, linear to moderate gilgai microrelief (vertisol, dermosol).
Description	Surface: Moderate blocky structure, usually self-mulching; Surface texture: light clay to clay; Subsoil texture: medium to heavy clay.
Water availability	Moderate; plant available water capacity (PAWC) 100 – 150 mm in root zone.
Rooting depth	Effective rooting depth 80–150 cm.

Fertility	Low organic carbon and nitrogen; very low to medium available phosphorus, very low to low zinc.
Salinity	Very low to low at the surface; moderate to very high saline subsoils.
Sodicity	Non-sodic at surface; strongly sodic subsoils.
pH	Alkaline to strongly alkaline at the surface; strongly acid 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 582 – 666 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	6730 - 6920	30%	1.4 – 1.4
	13 TBA 31 FPC	4050 - 4750	30%	2.1 – 2.4
Sown			35%	

Enterprise

Growing and finishing.

Land use and management recommendations

- Suitable for grazing of native and improved pastures and for most field and forage crops.
- Use of runoff control structures (contour banks, waterways), maintaining effective ground cover and conservative stocking practices (spelling pastures, flexible stocking rates) are important to reduce runoff and minimise risk of sheet, rill and wind erosion.
- If regrowth is limiting pasture growth control by burning every 3 – 5 years.
- Sandy loam to light clay soils are prone to structural and nutrient decline.
- Brigalow and limebush regrowth.

Land use limitations

Conservation features and related management

- These woodlands have been heavily cleared and are considered 'endangered' with approximately 10% of the pre-European extent remaining.
- Brigalow, particularly in association with belah, provides habitat for a very high diversity of birds (yellow-tailed black-cockatoo, crested bellbird, spotted bowerbird), reptiles (eastern spiny-tailed gecko, slider and striped skinks), and insectivorous bats including the vulnerable greater long-eared bat.
- Softwood scrub remnants are threatened by weed invasion (lantana) and fire on the margins. Fire breaks and cool season burns reduce this risk.
- The productivity values to wildlife and health of these areas can be enhanced using soil conservation techniques to minimise soil erosion, using fire to control regrowth, and maintaining connected timbered areas.

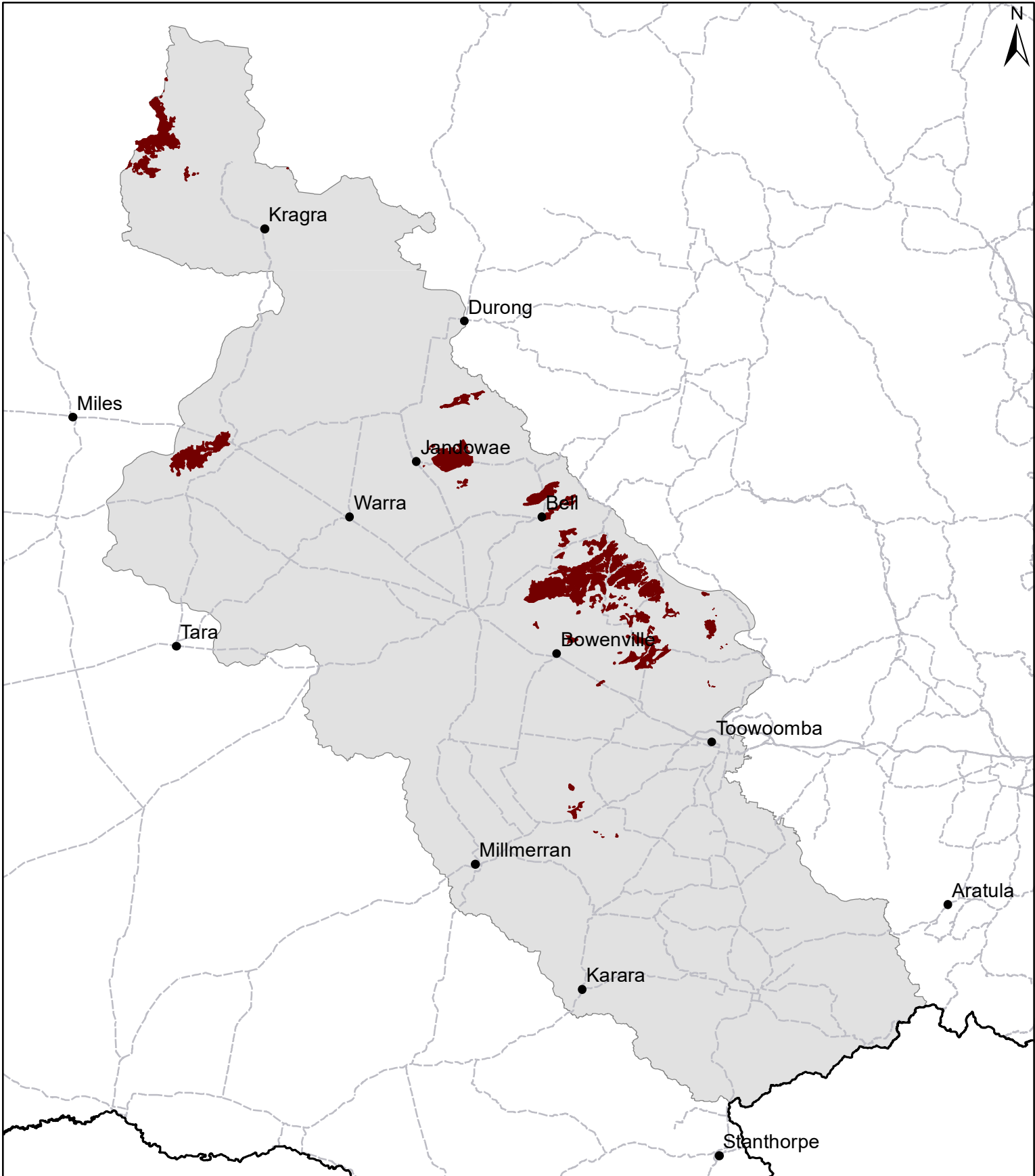
Regional Ecosystems

11.9.5, 11.9.5a, 12.8.23, 12.9-10.6

Land units; Agricultural management unit; Soil associations

Central Darling Downs Land Management Manual: 6a, 6c (*Acland, Clayburn, Edgefield, Gate, Moola, Wynhari*); Understanding and Managing Soils in the Murilla, Tara and Chinchilla Shires: 5a, 5b (*Moola*). Land Inventory and Technical Guide Eastern Downs Area: (*Edgefield, Gate, Malling, Moola*); Description and Management of the Soils of the Eastern Darling Downs Queensland: (*Acland, Gate, Grays, Moola*).

DD04 Brigalow belah uplands



Area of land type in region: 2%
Median rainfall (region): 580 – 909 mm
Average rainfall (region): 585 – 927 mm
Area of land type with FPC: 18%
Median FPC: 31%
Median TBA: 13 m²/ha



Queensland
Government

Brigalow melonhole plains



Landform	Flat to gently undulating plains.
Woody vegetation	Brigalow and belah scrub with black tea tree in low lying areas. Occasionally an understorey of wilga, false sandalwood or limebush. Higher proportions of belah indicate lighter clay surface soils and often larger, rolling melonholes. Brigalow/tea tree mix indicates heavier soil surface conditions.
Expected pasture composition	<i>* Denotes non-native "Expected Pasture Composition" species.</i>
Preferred	Queensland bluegrass, brigalow grass, forest bluegrass, shot grass, paspalum* and early spring grass.
Intermediate	Pitted bluegrass, fairy grass, Warrego summer grass, curly windmill grass, beetle grass and weeping panic. Umbrella canegrass in melonholes.
Non-preferred	White speargrass, green couch.
Common forbs and legumes	Mueller's saltbush, climbing saltbush, New Zealand spinach and Sesbania pea. Non-preferred species include dog and galvanised burrs, budda pea, sedges, stinkgrass* and soft roly poly.
Suitable sown pastures	Bambatsi and Angleton bluegrass (Floren) will stand some waterlogging. Creeping bluegrass, Gatton panic, Rhodes grass (Katambora types) and buffel grass on the western belah type clay/loams. Medics (barrel, button and spineless burr), Caatinga stylo, desmanthus and leucaena (soils >120 cm).
Introduced weeds	Lippia, mother-of-millions, prickly pear, tree pear, tiger pear and African boxthorn.
Soil	Deep to very deep self-mulching grey to brown cracking clays with gilgai (melonholes) on the brigalow claysheet (vertosol).
Description	Surface: angular blocky structure with self-mulching surface; Surface texture: dark greyish brown or grey clays; Subsoil texture: dark grey structured clays, becoming browner with depth.
Water availability	Moderate to high; plant available water capacity (PAWC) 200 – 250 mm shallow gilgai; PAWC 100 – 150 mm deep gilgai.

Rooting depth

Fertility

Salinity

Sodicity

pH

Moderately fertile. Responds to nitrogen, phosphorus, zinc and occasionally copper.

Strongly saline at depth.

Strongly sodic at depth.

Strongly to mildly alkaline (pH 9.0 – 7.8) at surface to strongly acid (pH 4.5 –5.5) at depth. Variable with gilgai.

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 582 – 666 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	2740 - 3090	30%	3.2 - 3.6
	10 TBA 25 FPC	1520 - 1790	30%	5.4 – 6.4
Sown			35%	

Enterprise

Growing and finishing.

Land use and management recommendations

- Use improved pasture species capable of handling limited periods of waterlogging, particularly in the melonholes.
- Sulphur required to maintain sown pasture species.

Land use limitations

- Poor drainage and gilgais.
- PAWC is limited by depth to the sodic and highly saline subsoil.
- Occasional overland erosive flooding.
- Regrowth, particularly of limebush and brigalow, is a problem.
- Mechanical timber regrowth control is difficult due to the melonholes.
- Levelling will expose strongly sodic and highly saline subsoils which cause plant regrowth problems.
- While pasture growth can be good in shallow melonhole country, there tends to be little pasture growth in the bottom of deep melonholes. Water can sit in deep melonholes for a long time.

Conservation features and related management

- Conservation status of remnant vegetation is endangered.
- Specific habitat for threatened flora species including *Xerothamnella herbacea* (Endangered) and *Eucalyptus argophloia* (Vulnerable), and the pale imperial hairstreak butterfly (*Jalmenus eubulus*).
- Larger gilgai may provide ephemeral wetland habitat.
- This regional ecosystem has been almost completely cleared and exists primarily as regrowth or isolated paddock trees of *Eucalyptus argophloia*.

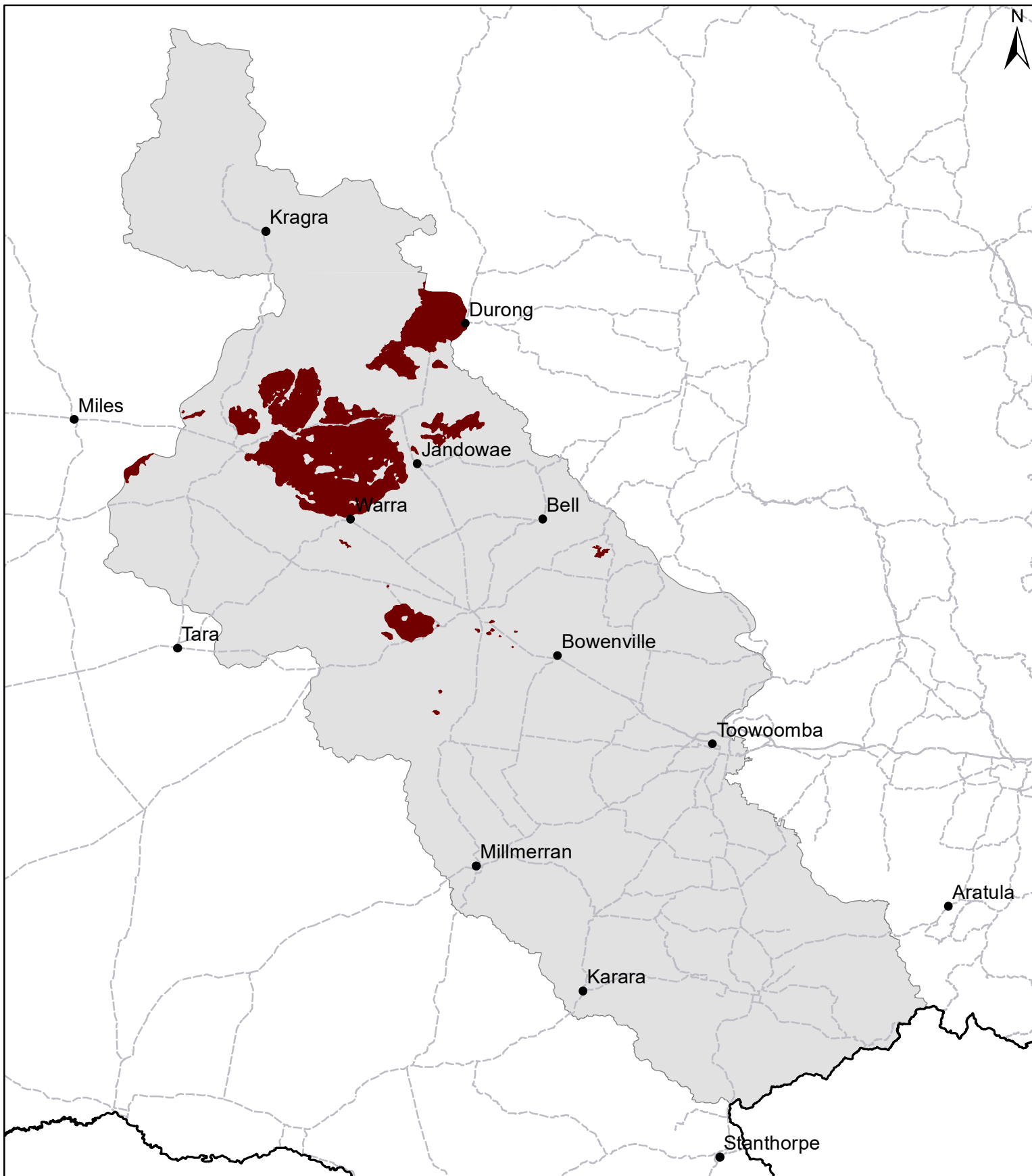
Regional Ecosystems

11.3.1, 11.4.3a

Land units; Agricultural management unit; Soil associations

Central Darling Downs Land Management Manual: 5a, 5b (*Belahville, Kupunn, Langlands, Tara*); Understanding and Managing Soils in the Murilla, Tara and Chinchilla Shires: 4a, 4b, (*Kupunn, Tara*).

DD05 Brigalow melonhole plains



Area of land type in region: 6%
Median rainfall (region): 580 – 909 mm
Average rainfall (region): 585 – 927 mm
Area of land type with FPC: 12%
Median FPC: 25%
Median TBA: 10 m²/ha



Queensland
Government

Cypress pine sands



Landform	Flat to gently undulating sandy alluvial plains.
Woody vegetation	Open forest of cypress pine, rusty gum and tumbledown gum. Often associated with rough-barked apple, Queensland blue gum and Moreton Bay ash and occasionally with bullock on shallower soils.
Expected pasture composition	<i>* Denotes non-native "Expected Pasture Composition" species.</i>
Preferred	Black speargrass, forest bluegrass and golden beard grass.
Intermediate	Pitted bluegrass, lovegrasses, barbwire grass, tall chloris, bottlewasher grasses, poverty grass and beetle grass.
Non-preferred	Many-headed wiregrass, dark wiregrass, Jericho wiregrass, purple wiregrass and rough speargrass.
Common forbs and legumes	Yellow daisy burr, yellow buttons, woolly glycine.
Suitable sown pastures	Digit grass, tall finger grass, Rhodes grass (Katambora types) and buffel grass in western areas. Yellow serradella (with phosphorus applied).
Introduced weeds	African lovegrass, tree pear, Chilean needle grass, harrisia cactus and tiger pear, cottontails.
Soil	Generally deep (100 – 150 cm) sands and deep bleached sands over mottled yellow, grey or brown clays.
Description	Surface: Loose; Surface texture: sand to sandy loam; Subsoil texture: light medium clay, coarse sand (chromosol).
Water availability	Low; plant available water capacity (PAWC) in root zone <50 mm.
Rooting depth	Effective rooting depth 80 - 120 cm.
Fertility	Very low carbon and nitrogen, medium to low phosphorus.
Salinity	Very low.

Sodicity
pH

Non-sodic at surface; sodic subsoils.

Slightly acid (5.7) to neutral at surface; neutral (6.8) down the 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 580 – 655 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	2150 - 2520	20%	5.8 – 6.8
	14 TBA 35 FPC	720 - 560	20%	20 – 26
Sown			25%	

Enterprise

Breeders.

Land use and management recommendations

- Suitable for forage crops (mostly oats).
- Limited suitability for winter crops in deeper topsoils and for horticultural crops (some olives) where the surface soils are deep and there is adequate irrigation water.
- Suitable for grazing of native and improved pastures.
- Cultivated soils on sloping lands are at risk of erosion. It is important to protect soils with surface cover and to use runoff control measures on these fragile soils.
- Conservative stocking practices; judicious use of fire and clearing methods; and appropriate location of tracks, fencing, firebreaks and watering points on native and sown pasture lands can minimise runoff and reduce the risk of sheet, rill and gully erosion.
- If regrowth is dense and limiting pasture growth control by burning every 3 – 5 years.

Land use limitations

- Establishing sown pastures can be difficult because of low fertility and low water holding capacity of soils.
- Sodic, dispersive subsoils.
- If pimelea is present livestock access to country needs to be restricted to prevent animal husbandry problems occurring.
- Use of phosphate when growing serradella is recommended.

Conservation features and related management

- Cypress pine forests provide extensive habitat for a range of insectivorous birds and cockatoos.
- They are prone to structural changes depending on fire regimes.
- Maintaining timbered areas can allow connectivity of remnants through habitat corridors and greatly increase the value of these areas of land to wildlife and the overall health of the system.
- Maintaining ground cover and using conservation soil practices in these areas are important to minimise soil erosion and help protect the wildlife habitat.

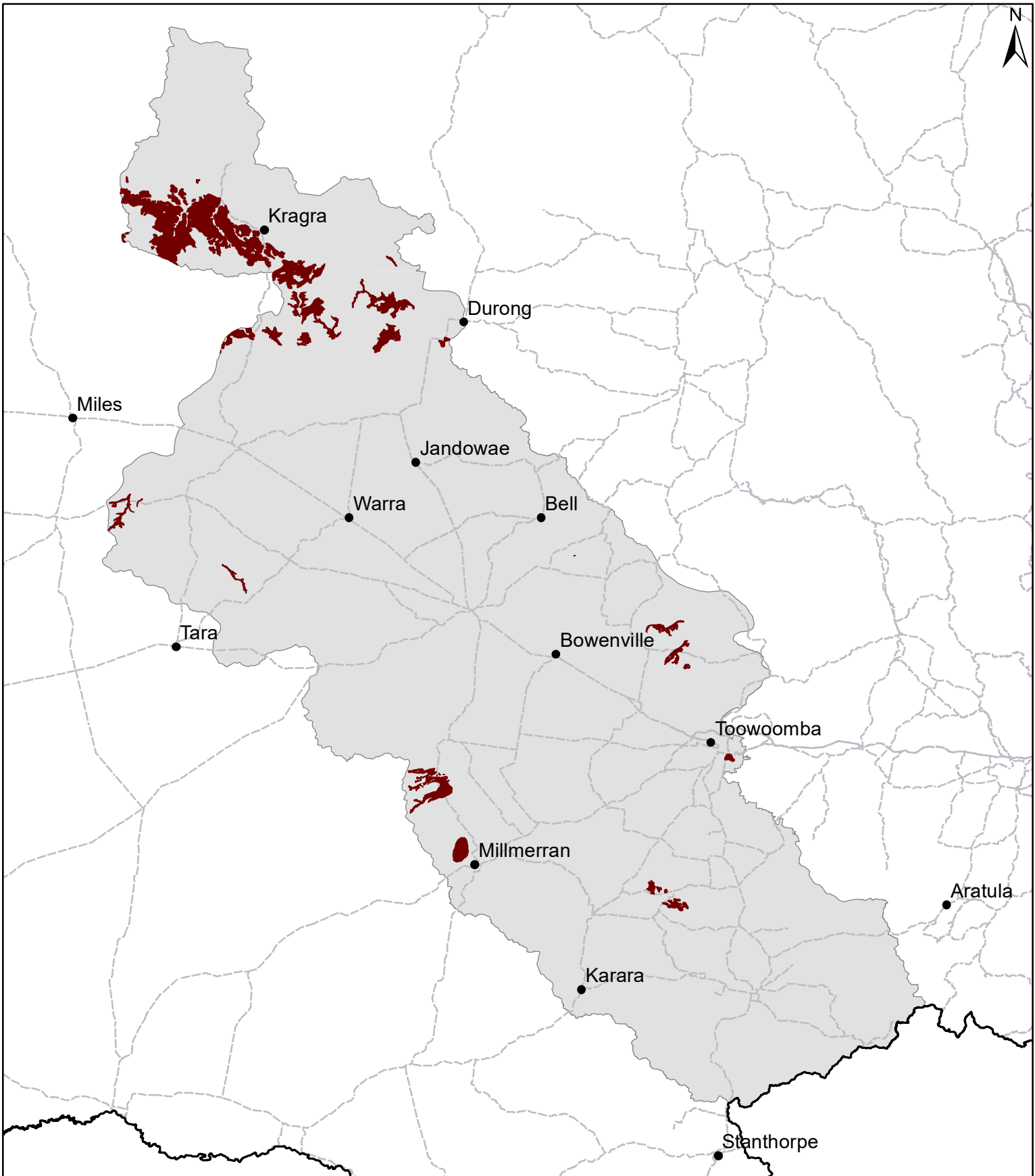
Regional Ecosystems

11.3.14, 11.3.18, 11.5.21, 11.5.2a, 11.5.4

Land units; Agricultural management unit; Soil associations

Central Darling Downs Land Management Manual: 4a, 11a (*Chinchilla, Combidiban, Davy*); Understanding and Managing Soils in the Murilla, Tara and Chinchilla Shires: 3b (*Chinchilla, Combidiban, Davy*).

DD06 Cypress pine sands



Area of land type in region: 3%
Median rainfall (region): 580 – 909 mm
Average rainfall (region): 585 – 927 mm
Area of land type with FPC: 87%
Median FPC: 35%
Median TBA: 14 m²/ha



Queensland
Government

Granite rises



Landform

Undulating to rolling granite hills and associated ridges. Granite rock outcrops are common.

Woody vegetation

New England blackbutt shrubby open forest with narrow-leaved ironbark, gum-topped box, grey box, tumbledown gum, Youman's stringybark, Caley's ironbark and broad-leaved stringybark.

Expected pasture composition

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

Preferred

Wallaby grass, kangaroo grass, paspalum*, silky browntop and barbwire grass.

Intermediate

Pitted bluegrass, hairy panic, summer grass and tall chloris.

Non-preferred

Many-headed wiregrass, rough speargrass, plume grass, forest hedgehog grass, weeping lovegrass and blady grass.

Common forbs and legumes

Yellow buttons, glycine pea, sundews, bluebells, cudweeds. Non-preferred species include bracken fern, sedges and pinrush.

Suitable sown pastures

Digit grass, fescue, ryegrass and Brunswick grass. Sub clover, biserrula and serradella (yellow and slender) on deeper sands.

Introduced weeds

African lovegrass, tree pear and blackberry.

Soil

Shallow to moderately deep gritty sands which are highly permeable and well drained (tenosol).

Description

Surface: loose; **Surface texture:** Very dark grey to brown loamy coarse sands; **Subsoil texture:** brown clayey to coarse sandy clay loam, massive with quartz gravel.

Water availability

Very low; plant available water capacity (PAWC) <50 mm.

Rooting depth

Below 45 cm.

Fertility	Very low. Responds to nitrogen, phosphorus, copper, potassium and zinc.
Salinity	Slightly acid (pH 6.0 – 6.5).
Sodicity	Non-sodic.
pH	Strongly alkaline.

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 628 – 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	2590 - 2710	20%	5.4 – 5.6
	10 TBA 25 FPC	870 - 1580	20%	9.2 – 17
Sown			25%	

Enterprise

Breeding or fine wool production.

Land use and management recommendations

- This soil is best left undeveloped and in its native state – mostly suitable for native pastures only. Small areas may be suitable for sown pastures.
- Good bee and nature conservation country if not cleared.
- Stringybark and blackbutt may be useful farm timber.

Land use limitations

- Shallow rooting depth.
- Erosion risk due to steep slopes.
- Excessive rockiness prevents cultivation.
- Waterlogging can occur due to hardpans or rock.
- Effective rooting depth is limited to depth of hardpan or rock (usually 25–50 cm).

Conservation features and related management

- Conservation status of remnant vegetation is currently not of concern.
- Habitat for threatened plant species including *Boronia granitica*, *B. repanda*, *Macrozamia viridis*, *Tylophora woollsii*, *Acacia pubifolia*, *A. ruppii*, *Bertya glandulosa*, *Grevillea scortechinii*, *Phebalium whitei*, *Acacia latisejala*, *Hibbertia elata*, *Conospermum burgessiorum*, *Boronia amabilis*, *Olearia gravis*, *Cryptandra lanosiplant* and *Hakea macrorrhyncha*.
- Protected areas in Girraween and Sundown National Parks.

Regional Ecosystems

11.9.9, 11.9.9a, 13.12.1, 13.12.10, 13.12.2, 13.12.5

Land units; Agricultural management unit; Soil associations

Central Darling Downs Land Management Manual:13a (*Banca*, *Cottonvale*); Stanthorpe Rosenthal Field Manual: Undulating low granite hills, Granite rises (*Banca*, *Cottonvale*, *Greymare*); Land Inventory and Technical Guide Eastern Downs Area: (*Herries*, *Turner*).

DD07 Granite rises



Area of land type in region: 2%
Median rainfall (region): 580 – 909 mm
Average rainfall (region): 585 – 927 mm
Area of land type with FPC: 64%
Median FPC: 25%
Median TBA: 10 m²/ha



Queensland
Government

Ironbark and mountain coolibah woodland on stony dark clay



Landform	Steep hillslopes and mountains, scarps and crest of ridges along the Great Dividing Range.
Woody vegetation	Grassy forest to woodland of mountain coolibah and narrow-leaved ironbark that may have softwood scrub (bottletree, scrub boonaree, round-leaved myrtle, native olive and wild rosemary) understorey. Other trees that may occur include silver-leaved ironbark, white box, blue gum and yellow box. Grass trees, wattle and cypress pine can be found in pockets along the scarp and ridges.
Expected pasture composition	* Denotes non-native "Expected Pasture Composition" species.
Preferred	Forest bluegrass and Queensland bluegrass.
Intermediate	Pitted bluegrass, cotton panic, curly windmill grass, brigalow grass, early spring grass, tall chloris and barbwire grass.
Non-preferred	Green couch, foxtail, rough speargrass, white speargrass and wiregrasses.
Common forbs and legumes	Zinnia* (non-preferred).
Suitable sown pastures	Green panic, Gatton panic, Rhodes grass (Katambora types), digit grass and creeping bluegrass (Bisset). Lucerne, medics (barrel and spineless burr) and Caatinga stylo.
Introduced weeds	Lantana, African boxthorn, tree pear, tiger pear, prickly pear and mother-of-millions.
Soil	Very shallow, stony, dark cracking clay overlying basalt (vertosol, dermosol).
Description	Surface: Abundant stones; Surface texture: black, dark brown or dark grey medium clay; Subsoil texture: heavy clay with increasing stones to hard basalt.
Water availability	Very low; plant available water capacity (PAWC) <50 mm.

Rooting depth
Fertility
Salinity
Sodicity
pH

Shallow effective rooting depth (5 – 30 cm).
Low fertility; responds to nitrogen, sulphur and occasionally phosphorus and potassium.
Very low.
Non-sodic.
Neutral at the surface (pH 6.5 – 7.5); mildly to strongly alkaline in subsoils (pH 7.5 – 8.5).

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 580 – 729 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	3130 - 3880	25%	3.0 – 3.7
	9 TBA 23 FPC	1730 - 2680	25%	4.4 – 6.8
Sown			30%	

Enterprise

Breeding

Land use and management recommendations

- Shallow, soils with stone and gravel throughout profile.
- These grassed areas may provide valuable water dispersal for cultivated areas on the lower slopes.
- Maintaining effective ground cover and conservative stocking practices (spelling pastures, flexible stocking rates) are important to minimise the risk of sheet, rill and gully erosion and reduce runoff.
- If regrowth is limiting pasture growth control by burning every 3 – 5 years.
- Stock generally move off the creek flats and up into this land type during winter where they will browse woody plants and selectively graze unfrosted pasture plants.
- Good bee and nature conservation country.

Land use limitations

- Non-arable due to shallow soil depths, low water availability and large amounts of stone.
- Not suitable for constructing waterways and contour banks due to shallow soil depth.
- Timber and wattle regrowth can limit productivity.

Conservation features and related management

- Extensive areas of these forest or woodlands, particularly areas of softwood scrub and/or white box, have been cleared.
- The woodlands provide habitat for insectivorous and nectivorous birds and mammals and a number of rare and threatened flora (lobed bluegrass, finger panic grass, Baileys indigo, native hawk weed, austral toadflax and native thistle).
- Softwood scrub remnants are threatened by weed invasion (lantana) and fire on the margins. Fire breaks and cool season burns reduce this risk.
- Maintaining timbered areas can allow connectivity of remnants and habitat corridors, encourage habitat diversity, and greatly increase the value of these areas of land to wildlife and the overall health of the system.

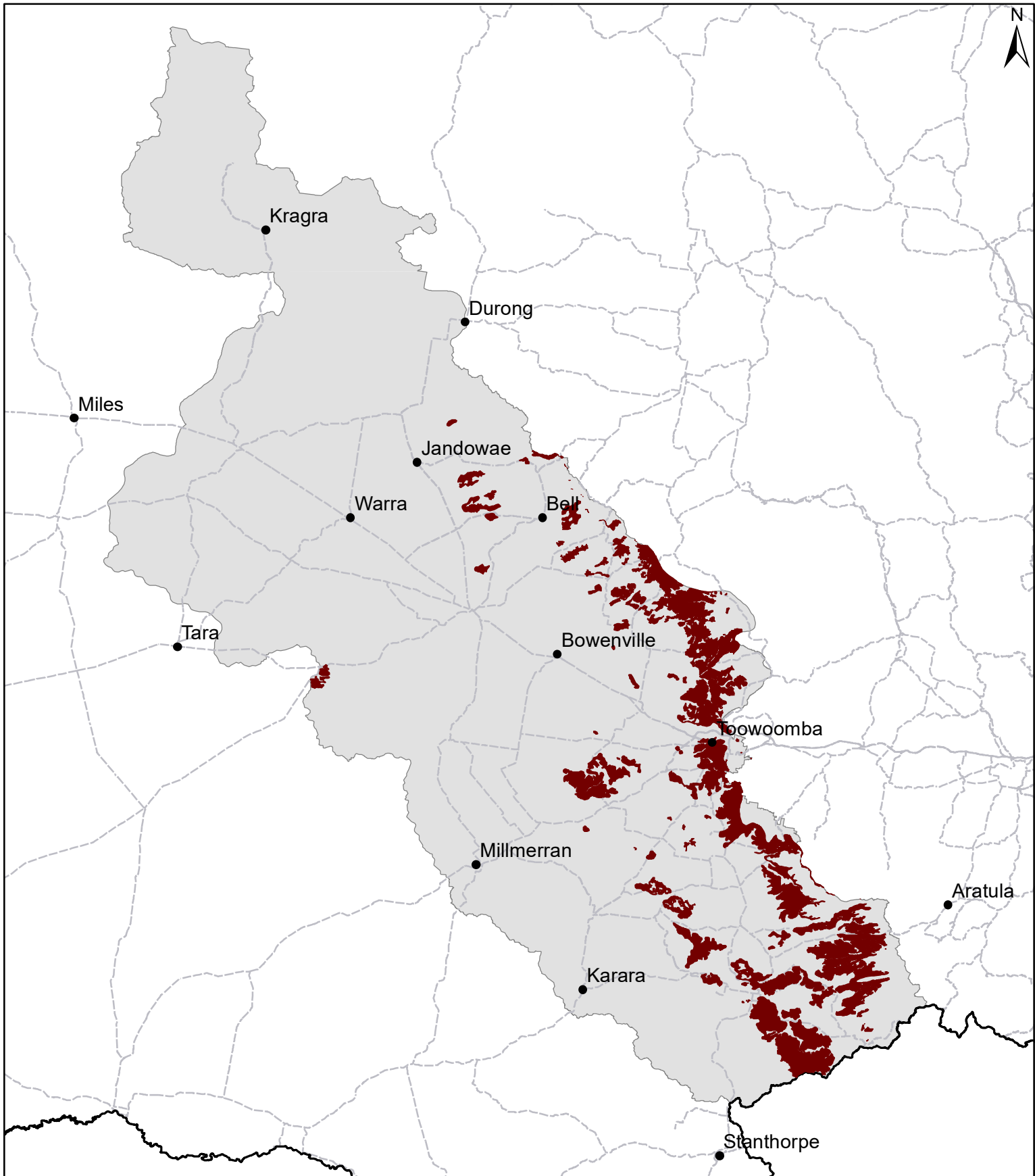
Regional Ecosystems

11.8.5, 11.8.5a, 11.8.8, 11.9.9, 12.8.15, 12.8.16, 12.8.17

Land units; Agricultural management unit; Soil associations

Central Darling Downs Land Management Manual: 7c (*Beauaraba*, *Charlton* - shallow phase, *Purrawunda* - shallow phase); Land Inventory and Technical Guide Eastern Downs Area: (*Beauaraba*); Description and Management of the Soils of the Eastern Darling Downs Queensland (*Beauaraba*, *Purrawunda* -shallow phase).

DD08 Ironbark and mountain coolibah woodland on stony dark clay



Area of land type in region: 7%
Median rainfall (region): 580 – 909 mm
Average rainfall (region): 585 – 927 mm
Area of land type with FPC: 53%
Median FPC: 23%
Median TBA: 9 m²/ha



Queensland
Government

Mountain coolibah and ironbark rises on shallow, stony soils



Landform	Upper slopes, benches and broad flat-topped ridges of basalt.
Woody vegetation	Mountain coolibah and narrow-leaved ironbark or silver-leaved ironbark woodland with Moreton Bay ash and rough-barked apple. May have softwood scrub understorey.
Expected pasture composition	* Denotes non-native "Expected Pasture Composition" species.
Preferred	Forest bluegrass, Queensland bluegrass, brigalow grass and early spring grass.
Intermediate	Pitted bluegrass, cotton panic, curly windmill grass, yabila grass, tall chloris and barbwire grass.
Non-preferred	Green couch, limestone bottlewasher, foxtail, white speargrass, western rat's tail grass, dark wiregrass and many-headed wiregrass.
Common forbs and legumes	Trefoil, rhynchosia, malvastrum and blue crowfoot. Non-preferred species include Mayne's pest, zinnia* and sedges.
Suitable sown pastures	Green panic, Gatton panic, Rhodes grass (Katambora types), creeping bluegrass (Bisset) and digit grass. Medics (barrel, spineless burr), Caatinga stylo and woolly pod vetch.
Introduced weeds	Lantana, African boxthorn, tree pear, tiger pear, prickly pear and mother-of-millions.
Soil	Shallow to moderately deep stony, red to brown loam to clay loam on basalt (ferrosol, dermosol).
Description	Surface: Abundant basalt gravel and cobbles (floaters) with some rock outcrop; Surface texture: Red to brown clay loam; Subsoil texture: clay loam sometimes grading to clay with depth.
Water availability	Low to moderate; plant available water capacity (PAWC) 50 – 150 mm.

Rooting depth
Fertility
Salinity
Sodicity
pH

Shallow effective rooting depth (5 – 30 cm).
Low fertility; responds to nitrogen, phosphorus and sulphur.
Very low.
Non-sodic.
Weakly acidic at the surface; neutral to slightly alkaline 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 582 – 729 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	5620 - 5630	25%	2.1 – 2.1
	13 TBA 32 FPC	3120 - 4420	25%	2.6 – 3.7
Sown			25%	

Enterprise

Breeding.

Land use and management recommendations

- Shallow, soils with stone and gravel throughout profile.
- Large amounts of stone near the soil surface may cause problems with cultivation and crop establishment.
- Susceptible to moderate sheet and rill erosion depending on the amount of stone; erosion is more severe if the stone is removed.
- Sulphur required to maintain sown pasture species.
- Good source of gravel.
- Good bee and nature conservation country.
- Ironbark can be a good source of millable timber.

Land use limitations

- Non-arable due to shallow soil depths, low water availability and large amounts of stone.
- Not suitable for constructing waterways or contour banks due to shallow soil depth.
- Timber and wattle regrowth can limit productivity.

Conservation features and related management

- Extensive areas of these forests and woodlands, particularly areas of softwood scrub and/or white box, have been cleared.
- The woodlands provide habitat for insectivorous and nectivorous birds and mammals and a number of rare and threatened flora (lobed bluegrass, finger panic grass, Bailey's indigo, native hawk weed, austral toadflax, native thistle).
- Softwood scrub remnants are threatened by weed invasion (lantana) and fire on the margins. Fire breaks and cool season burns reduce this risk.
- Maintaining timbered areas can allow connectivity of remnants and habitat corridors, encourage habitat diversity, and greatly increase the value of these areas of land to wildlife and the overall health of the system.

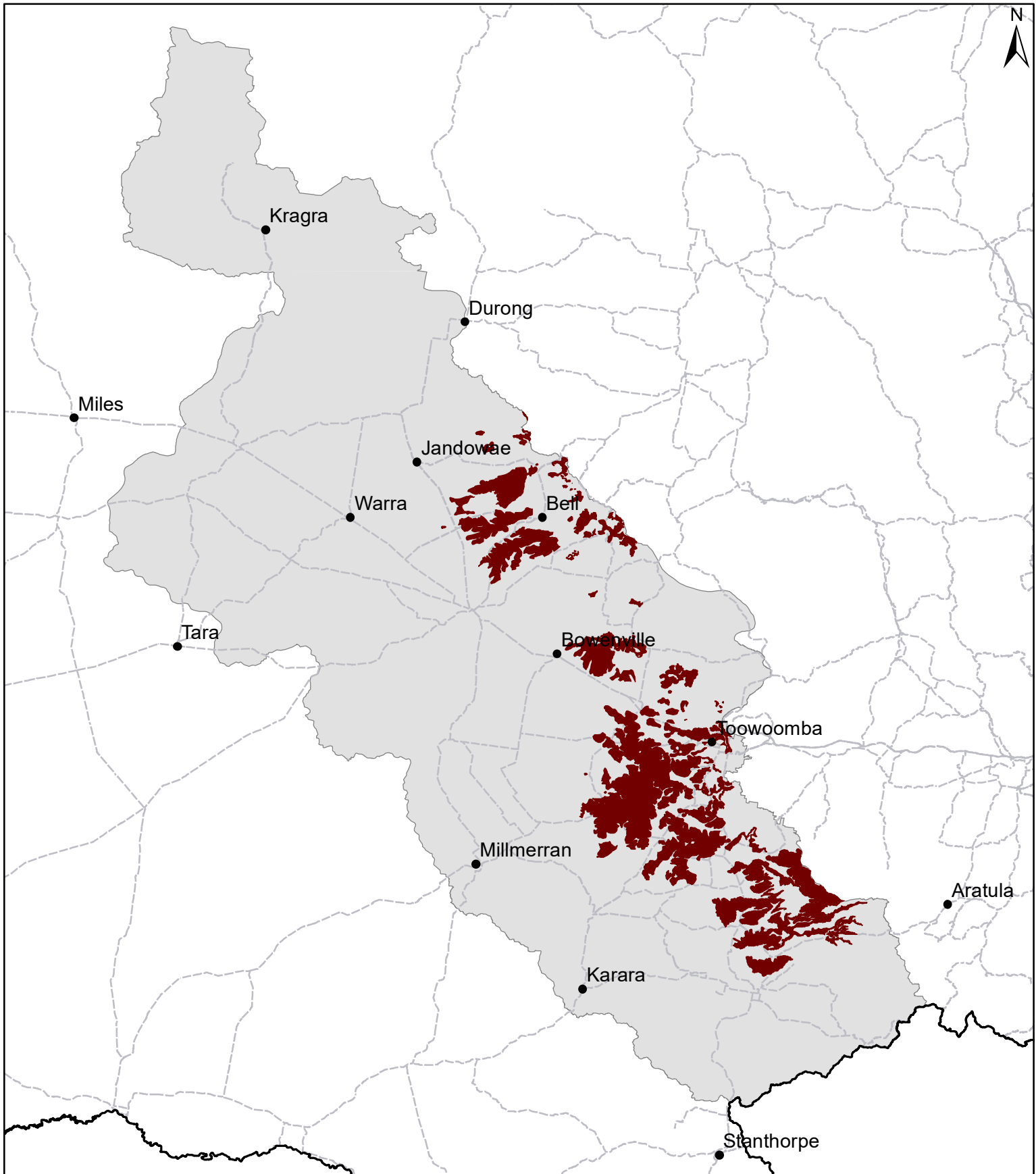
Regional Ecosystems

11.8.2a, 11.8.4, 11.8.5, 11.8.9

Land units; Agricultural management unit; Soil associations

Central Darling Downs Land Management Manual: 7c (*Aubigny, Kenmuir, Mallard, Southbrook*); Land Inventory and Technical Guide Eastern Downs Area: Description and Management of the Soils of the Eastern Darling Downs Queensland (*Kenmuir, Southbrook*); Description and Management of the Soils of the Eastern Darling Downs Queensland: (*Kenmuir, Mallard, Southbrook*).

DD09 Mountain coolibah and ironbark rises on shallow, stony soils



Area of land type in region: 7%
Median rainfall (region): 580 – 909 mm
Average rainfall (region): 585 – 927 mm
Area of land type with FPC: 31%
Median FPC: 32%
Median TBA: 13 m²/ha



Queensland
Government

Mountain coolibah open woodland



Landform

Undulating rises and low hills.

Woody vegetation

Mountain coolibah open woodland with grassy understorey. Localised areas of basalt uplands of poplar box grassy woodland with Moreton bay ash can be found east of Dalby along the Nungil Road and south to Oakey and Charlton.

Expected pasture composition

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

Preferred

Kangaroo grass, Queensland bluegrass, forest bluegrass, brigalow grass, early spring grass and satintop.

Intermediate

Pitted bluegrass, curly windmill grass, tall chloris, yabila grass and barbwire grass.

Non-preferred

Rough speargrass, dark wiregrass, western rat's tail grass, limestone bottlewashers, comb chloris and green couch.

Common forbs and legumes

Blue crowfoot, rhyncosia, glycine and trefoil. Non-preferred species include malvastrum, zinnia and sedges

Suitable sown pastures

Green panic, Gatton panic, Bambatsi, Angleton bluegrass (Floren), Rhodes grass (Katambora types) and creeping bluegrass (Bisset). Lucerne, desmanthus, leucaena, medics (barrel and spineless burr) and Caatinga stylo.

Introduced weeds

Lantana, African boxthorn, tree pear, tiger pear, mother-of-millions and prickly pear

Soil

Moderately deep to very deep (75 – 180 cm) dark greyish brown and brown cracking clays or clay loams. Linear gilgai microrelief may be evident (vertosol).

Description

Surface: Coarse, sometimes fine, self-mulching; **Surface texture:** heavy clay; **Sub-soil texture:** heavy clay with some carbonate nodules.

Water availability

High; plant available water capacity (PAWC) 100–250 mm in root zone.

Rooting depth

Effective rooting depth 50 – 150 cm.

Fertility

Moderate to high organic carbon, nitrogen and available phosphorus; low to medium zinc.

Salinity
Sodicity
pH

Very low to low at surface; increasing to medium saline subsoils.
Non-sodic at surface; occasionally sodic subsoil at depth.
Neutral at the surface; increasing to slight 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 582 – 729 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	7060 - 7140	30%	1.4 – 1.4
	11 TBA 27 FPC	1780 - 4000	30%	2.4 – 5.5
Sown			35%	

Enterprise

Mixed farming — cropping (forage and grain); breeding herds and finishing.

Land use and management recommendations

- Soil is prone to gully head development by undercutting when runoff is concentrated.
- Soil erosion can be controlled with broad based contour banks, waterways and conservative methods such as stubble mulching on slopes <8%.
- Grassed waterways should be maintained to provide ideal flow conditions and avoid erosion or excessive siltation.
- Maintaining effective ground cover and conservative stocking practices (spelling pastures, flexible stocking rates) are important to minimise the risk of sheet, rill and gully erosion, and reduce runoff.
- If dense regrowth is limiting pasture growth control by burning every 3 – 5 years.
- Fertilising with phosphorus and sulphur will improve production.

Land use limitations

- Small seeded sown pasture species may be difficult to establish on coarse and heavy clay soils.
- Timber regrowth can limit productivity.
- As soil depth decreases, so does pasture productivity.
- Persistent overgrazing results in wiregrass dominance.

Conservation features and related management

- These woodlands provide important habitat for arboreal mammals and birds.
- A number of rare and threatened flora (austral toadflax, Australian anchor plant, native thistle and native hawkweed) are associated with this land type.
- Maintaining timbered areas can allow connectivity of remnants through habitat corridors and greatly increase the value of these areas of land to wildlife and the overall health of the system.
- Maintaining ground cover and using soil conservation practices in these areas is important to minimise soil erosion and help protect the wildlife habitat.

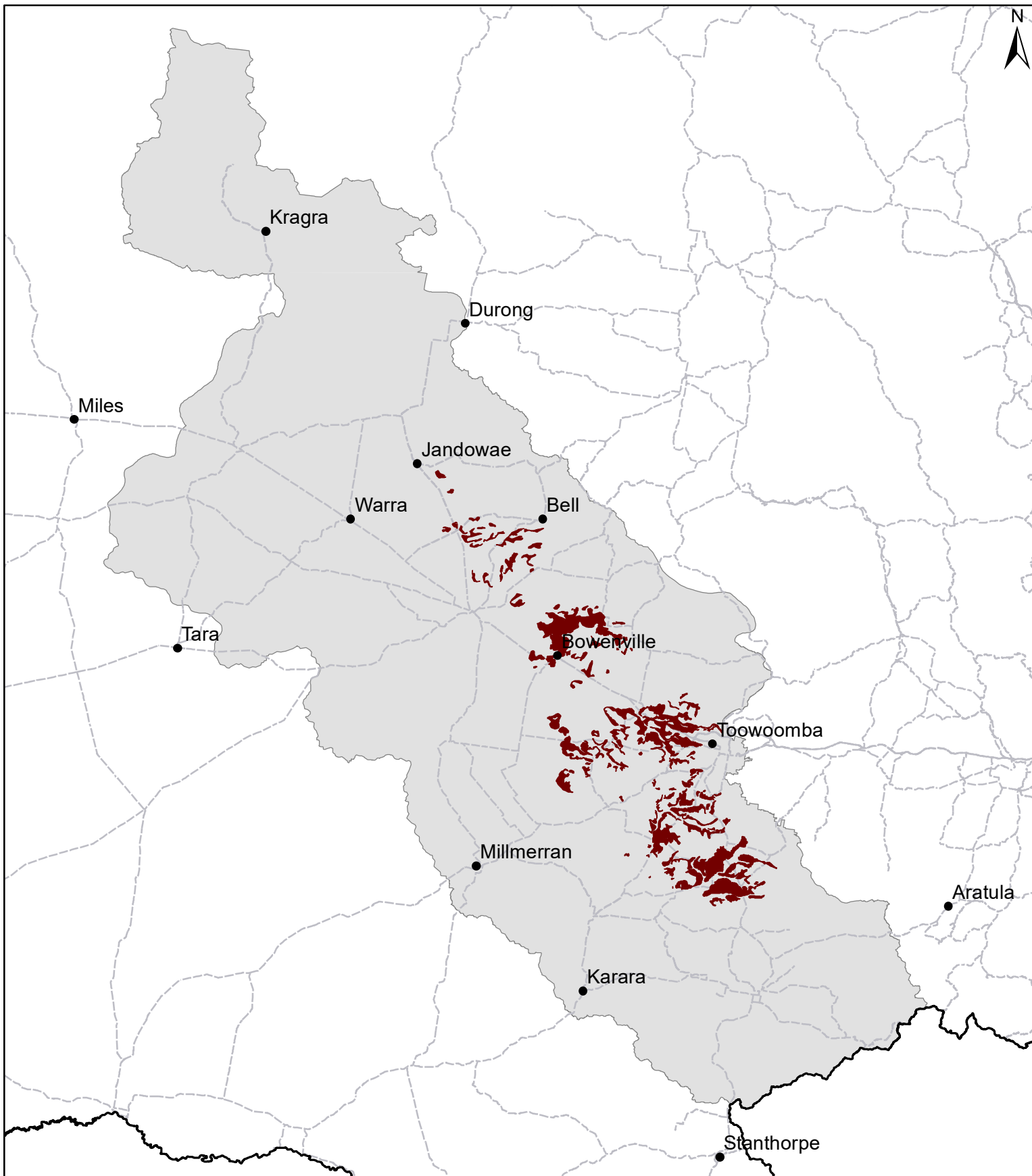
Regional Ecosystems

11.8.11, 11.8.15

Land units; Agricultural management unit; Soil associations

Central Darling Downs Land Management Manual: 7a, 7b (*Aberdeen, Charlton, Craigmore, Irving, Nungil, Purrawunda*). Land Inventory and Technical Guide Eastern Downs Area: (*Charlton, Craigmore, Irving, Purrawunda*); Description and Management of the Soils of the Eastern Darling Downs Queensland: (*Charlton, Craigmore, Irving, Purrawunda*).

DD10 Mountain coolibah open woodland



Area of land type in region: 2%
Median rainfall (region): 580 – 909 mm
Average rainfall (region): 585 – 927 mm
Area of land type with FPC: 5%
Median FPC: 27%
Median TBA: 11 m²/ha



Queensland
Government

Narrow-leaved ironbark and bulloak on sodic duplex soils



Landform	Gently undulating plains and rises on sandstone.
Woody vegetation	Narrow-leaved ironbark, bulloak, gum-topped box, cypress pine on deeper soils, rusty gum and poplar box open forest with shrubby understorey of wattles and false sandalwood.
Expected pasture composition	* Denotes non-native "Expected Pasture Composition" species
Preferred	Black speargrass, forest bluegrass, golden beard grass, barbwire grass and kangaroo grass.
Intermediate	Pitted bluegrass, lovegrasses (e.g. purple, dainty), tall chloris, curly windmill grass, hairy panic and fairy grass.
Non-preferred	Purple wiregrass, dark wiregrass, Jericho wiregrass, many-headed wiregrass, small burrgrass, five-minute grass, rough speargrass and green couch.
Common forbs and legumes	Rhynchosia pea, woolly glycine, native indigo and native sensitive plant. Non-preferred species include common fringe-rush and mulga fern.
Suitable sown pastures	Rhodes grass (Katambora types), digit grass and buffel in western areas.
Introduced weeds	Lantana, African boxthorn, harissia cactus, tree pear, tiger pear, lippia, mother-of-millions, African lovegrass and giant rat's tail grass.
Soil	Texture contrast soil with thin (<15 cm) to thick (>30 cm) surface of bleached sands to loams over mottled, grey or yellow sandy clays (sodosol).
Description	Surface: Massive or loose; Surface texture: loamy sand to sandy clay loam; Subsoil texture: sandy clay to medium clay.
Water availability	Low to moderate; plant available water capacity (PAWC) <50 mm in root zone.
Rooting depth	Effective rooting depth generally 10 – 30 cm, occasionally to 60 cm.
Fertility	Low to moderate organic carbon and nitrogen, very low phosphorus, very low to low zinc.
Salinity	Very low to low at the surface, high to extremely saline subsoils.

Sodicity
pH

Non-sodic to sodic at surface; sodic to strongly sodic subsoils.

Weakly acidic or acidic at the surface; neutral, strongly acidic or strongly 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 580 – 666 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	3060 - 3750	20%	3.9 – 4.8
	11 TBA 28 FPC	1420 - 2060	20%	7.1 – 10
Sown			25%	

Enterprise

Breeding.

Land use and management recommendations

- This soil is best left in its native state. Suitable for grazing native pastures.
- Limited suitability for grazing on improved pastures in deeper surface soils and where there is adequate water.
- Maintaining effective ground cover and conservative stocking practices (spelling pastures, flexible stocking rates) are important to minimise the risk of sheet, and rill erosion.
- Minimise surface disturbance to reduce high erosion risk of soil surface.
- Appropriate location of tracks, fencing, watering points and firebreaks can limit the development of gullies.
- An active regrowth control program (e.g. selective chemical, burning every 3 – 5 years) may be required to maintain productivity levels.
- Narrow-leaved ironbark and cypress pine may be useful farm and millable timber.
- Good bee and nature conservation country, if not cleared.

Land use limitations

- Inherently infertile and fragile soils, though generally more productive than the stony ridges with hard setting, shallow soils.
- Timber thinning may be counter-productive in these areas.
- Sodic and saline subsoils limit effective rooting depth, available moisture and suitability for improved pastures.
- Texture contrast soils with sodic subsoils at less than 30 cm are susceptible to land degradation and limit clearing and cultivation practices.

Conservation features and related management

- These land types provide extensive habitat for insectivorous and nectivorous birds and mammals. Bullock seeds are an important food source for the vulnerable glossy black cockatoo.
- Habitat for threatened plant species including *Acacia handonis* and *Acacia argyrotricha*.

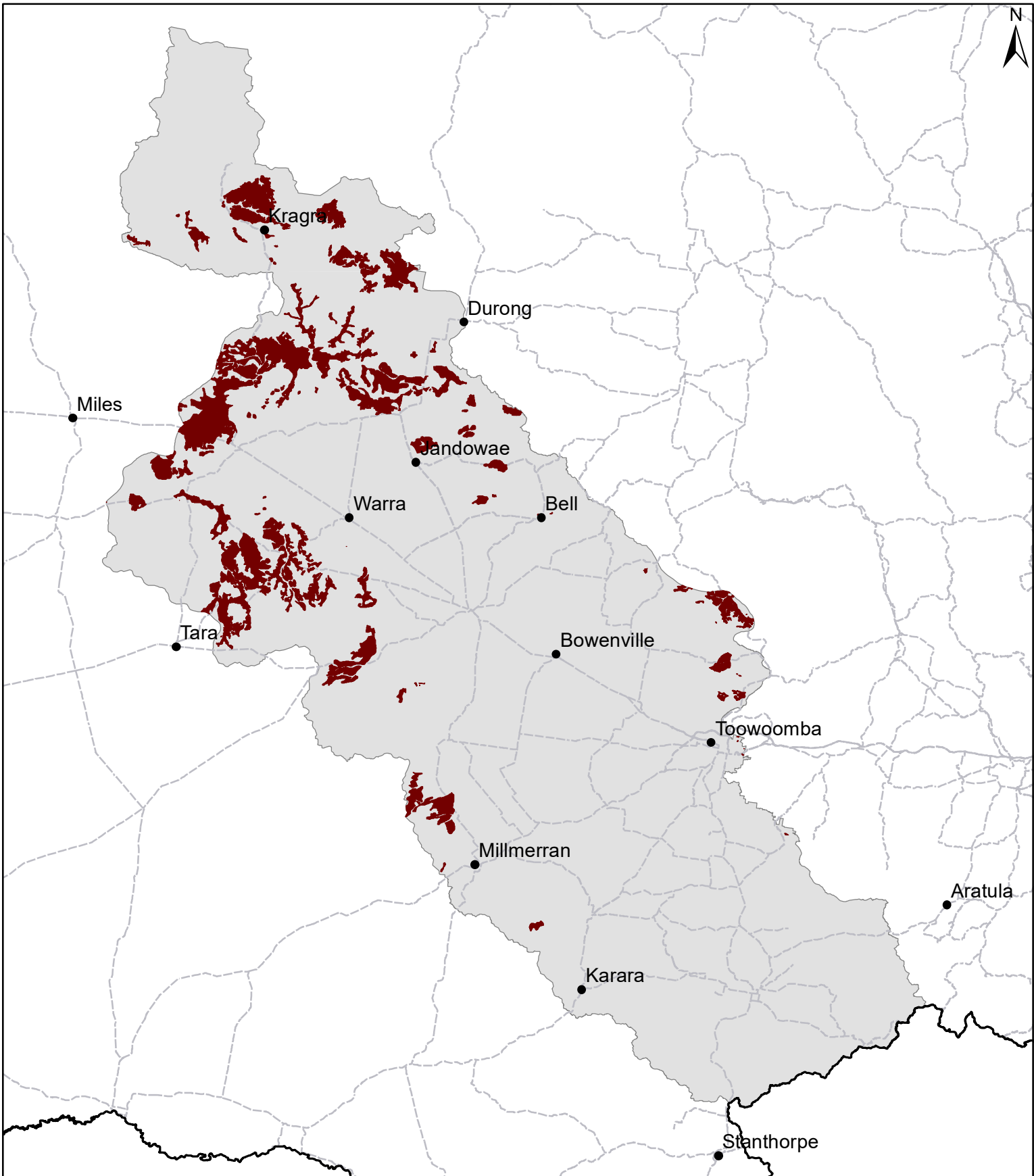
Regional Ecosystems

11.10.9, 11.5.1, 11.5.1a, 11.5.20, 11.9.9, 12.9-10.7

Land units; Agricultural management unit; Soil associations

Central Darling Downs Land Management Manual: 9b, 10a, 10b, 12a (*Allan, Binkey, Braemar, Channing, Cutthroat, Flinton, Hanmer, Werenga*); Understanding and Managing Soils in the Murilla, Tara and Chinchilla Shires: 2b, 7a, 7b, 7c, 9a, 9b (*Binkey, Braemar, Channing, Cutthroat, Highmount, Werenga*); Understanding and Managing Soils in the Stanthorpe – Rosenthal Region: Undulating sandstone rises (*Allan, Bonnie Doon, Dalveen, Hanmer Maxland*); Land Inventory and Technical Guide Eastern Downs Area: (*Allan, Ridge, Goombungee, Hendon, Morgan*); Description and Management of the Soils of the Eastern Darling Downs Queensland (*AMU 1, AMU 2, AMU 4, AMU 5, AMU 7, AMU 9, AMU 12, AMU 14*).

DD11 Narrow-leaved ironbark and bulloak duplex soils



Area of land type in region: 6%
Median rainfall (region): 580 – 909 mm
Average rainfall (region): 585 – 927 mm
Area of land type with FPC: 74%
Median FPC: 28%
Median TBA: 11 m²/ha



Queensland
Government

Poplar box creek flats



Landform	Level to very gently inclined (<1%) alluvial plains and stream terraces.
Woody vegetation	Poplar box grassy woodland with scattered Queensland blue gum, belah and Moreton Bay ash and an understorey of wilga and false sandalwood. Occasionally bulloak, sally wattle, myall, grey box and rough-barked apple may occur.
Expected pasture composition	* Denotes non-native "Expected Pasture Composition" species.
Preferred	Queensland bluegrass, black speargrass, forest bluegrass, kangaroo grass and barbwire grass.
Intermediate	Pitted blue grass, golden beard grass, hairy panic, tall chloris, purple lovegrass and twirly windmill grass.
Non-preferred	Wiregrasses (e.g. purple, many-headed), western rat's tail grass, green couch, limestone bottlewasher and fairy grass.
Common forbs and legumes	Rhynchosia pea, slender tick trefoil, emu foot, native sensitive plant, blue crowfoot and nardoo. Non-preferred species include cotton bush*, pigweed, mulga fern and galvanised burr.
Suitable sown pastures	Bambatsi, Gatton panic, green panic, creeping bluegrass (Bisset), digit grass and Rhodes grass (Katambora types). Lucerne, medics (barrel and button) and woolly pod vetch.
Introduced weeds	African boxthorn, tree pear, lippia, mother-of-millions, African lovegrass, harrisia cactus, tiger pear and giant rat's tail grass.
Soil	Texture contrast soils, occasionally deep (150 cm), clay loams over black, grey or brown clays (sodosol, chromosol).
Description	Surface: Hard-setting, sometimes bleached subsurface layer; Surface texture: sandy loam to clay loam; Subsoil texture: medium to heavy clay.
Water availability	Low to moderate; plant available water capacity (PAWC) 50 – 150 mm in root zone.
Rooting depth	Effective rooting depth 80 – 110 cm.

Fertility	Low to moderate organic carbon and nitrogen and variable available phosphorus (very low to very high).
Salinity	Low at the surface, moderate to highly saline subsoils.
Sodicity	Non-sodic at surface; sodic to strongly sodic subsoils.
pH	Very weakly acidic or neutral at the 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 580 – 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	2820 - 3650	30%	2.7 - 3.5
	12 TBA 29 FPC	2120 - 1240	30%	4.6 – 7.9
Sown			30%	

Enterprise

Breeding herds and growing.

Land use and management recommendations

- Generally, not suitable for cultivation except on the deeper soils where cultivation of winter field and short-term forage crops may be possible.
- Maintaining effective ground cover and conservative stocking practices (spelling pastures, flexible stocking rates) are important to minimise the risk of sheet, rill and gully erosion, and reduce runoff.
- Fertilising with phosphorus and sulphur will improve pasture production.

Land use limitations

- Prone to forming a hard surface crust after heavy rain.
- Poor infiltration.
- Occasional erosive flooding.
- Sodic subsoil, 'spewy' soils.
- Subsoil highly dispersive and erode if exposed.
- Cultivated lands on alluvial soils are subject to erosive flooding.
- Light textured soils that are low in organic matter and moderate acidity are susceptible to acidification.

Conservation features and related management

- These woodlands have been widely cleared.
- The woodlands provide habitat for arboreal mammals (e.g. koala), birds and the rare grass *Homophilis belsonii* can be locally common in lightly grazed areas.
- Restrict soil disturbance, particularly adjacent to incised watercourses, on dispersive soils and those prone to tunnelling.
- Maintaining timbered areas can allow connectivity of remnants through habitat corridors; provide firebreaks and shelter for crops and stock; provide protection for banks from slumping, act as floodwater filters and greatly increase the value of these areas of land to wildlife and the overall health of the system.
- Maintaining ground cover is important to minimise soil erosion.

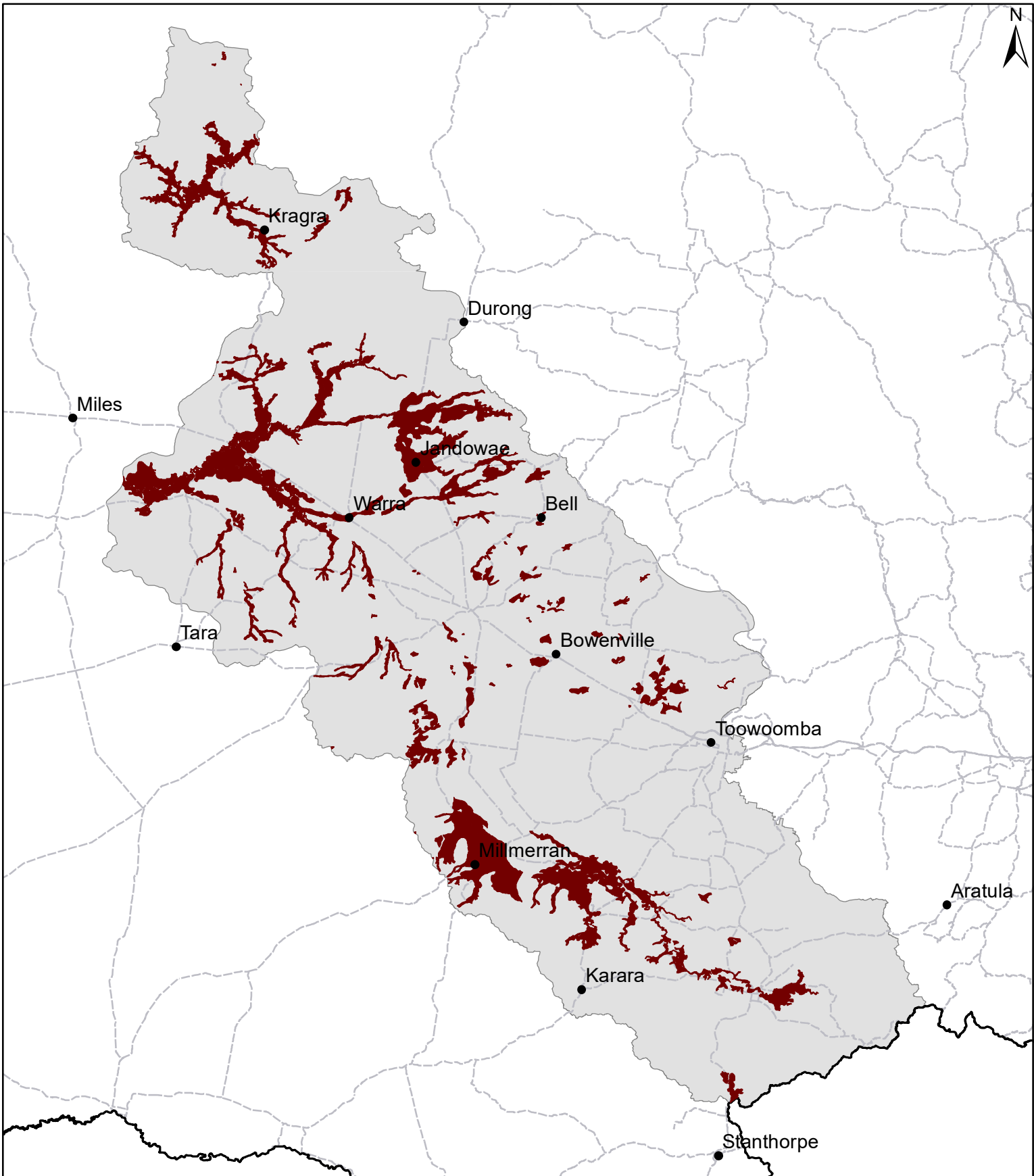
Regional Ecosystems

11.3.17, 11.3.18, 11.3.2, 11.3.27b, 11.3.3, 11.4.12, 13.9.2

Land units; Agricultural management unit; Soil associations

Central Darling Downs Land Management Manual: 2c, 2d, 3a, 9a (*Downfall, Formartin, Haslemere, Leyburn, Millmerran, Nudley Oakey*). Understanding and Managing Soils in the Murilla, Tara and Chinchilla Shires: 2a (*Arubial, Bogandilla, Coalbah*); Understanding and Managing Soils in the Stanthorpe-Rosenthal Region: Traprock/Sandstone Alluvial Plains (*Leyburn, Rodger*); Land Inventory and Technical Guide Eastern Downs Area: (*Canal, Cunningham, Dalmeny, Haslemere, Killarney, Oakey*).

DD12 Poplar box creek flats



Area of land type in region: 9%
Median rainfall (region): 580 – 909 mm
Average rainfall (region): 585 – 927 mm
Area of land type with FPC: 26%
Median FPC: 29%
Median TBA: 12 m²/ha



Queensland
Government

Poplar box plains



Landform	Elevated plains of mixed alluvium associated with the Condamine River.
Woody vegetation	Poplar box open woodland. May be associated with Queensland blue gum, river red gum and occasionally yarran, wilga and belah.
Expected pasture composition	
Preferred	Forest bluegrass, Queensland blue, silky browntop and native oats.
Intermediate	Pitted bluegrass, twirly windmill grass, golden beard grass and slender chloris.
Non-preferred	White speargrass, feathertop wiregrass, purple wiregrass, five-minute grass, small flinders grass, ray grass, fairy grass, limestone bottlewashers and slender bamboo grass.
Common forbs and legumes	Nardoo, ruby saltbush, climbing saltbush and sesbania pea. Non-preferred species include sedges, pigweed and galvanised burr.
Suitable sown pastures	Bambatsi, Rhodes grass (Katambora types), creeping bluegrass (Bisset) and Gatton panic. Lucerne, medics (barrel, burr and button), desmanthus, Caatinga stylo and leucaena.
Introduced weeds	African lovegrass, tiger pear, tree pear, mother-of-millions and lippia.
Soil	Deep to very deep, crusting, black, brown or dark grey cracking clay on alluvial plains of mixed origin (vertosol).
Description	Surface: weakly self-mulching; Surface texture: dark grey, brown or black cracking clays; Subsoil texture: grey to dark brownish grey clays with coarse blocky structure.
Water availability	High to very high; plant available water capacity (PAWC) 150 – >250 mm. May be limited by depth to sodic subsoil in some areas.
Rooting depth	80 – 180 cm

Fertility	Responds to nitrogen, phosphorus, zinc and sulphur.
Salinity	Moderately saline, becoming highly saline with depth.
Sodicity	Sodic to strongly sodic.
pH	Mildly alkaline at surface progressing to strongly alkaline at depth (pH 8.5 – 9.0).

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 582 – 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	2990 - 3650	30%	2.7 - 3.3
	12 TBA 29 FPC	1410 - 2120	30%	4.6 – 6.9
Sown			35%	

Enterprise

Growing and finishing.

Land use and management recommendations

- Most of this land type has been cleared for cultivation.
- Presswheels or rollers are useful to establish crops and sown pastures.
- Sulphur required to maintain sown pasture species.

Land use limitations

- The coarse structure of the soil creates problems with tillage, seedling establishment, water infiltration and wetting up the profile.
- When cultivated, these soils puddle badly following rain and form a hard surface crust or seal, making it difficult to maintain a fine seedbed condition.
- The surface crust results in impaired infiltration, poor germination and seedling emergence of small seeded crops and pastures.
- Occasional erosive flooding.
- Susceptible to wind and water erosion if surface soil is unprotected. 'Sand blasting', of young plants associated with wind erosion.

Conservation features and related management

- Conservation status of remnant vegetation is endangered.
- Habitat for threatened flora species *Homopholis belsonii*.
- Extensively cleared or modified by grazing.
- There are still substantial areas of this ecosystem remaining, although remnants are often degraded by grazing, dieback and associated lack of natural regeneration and weed invasion.

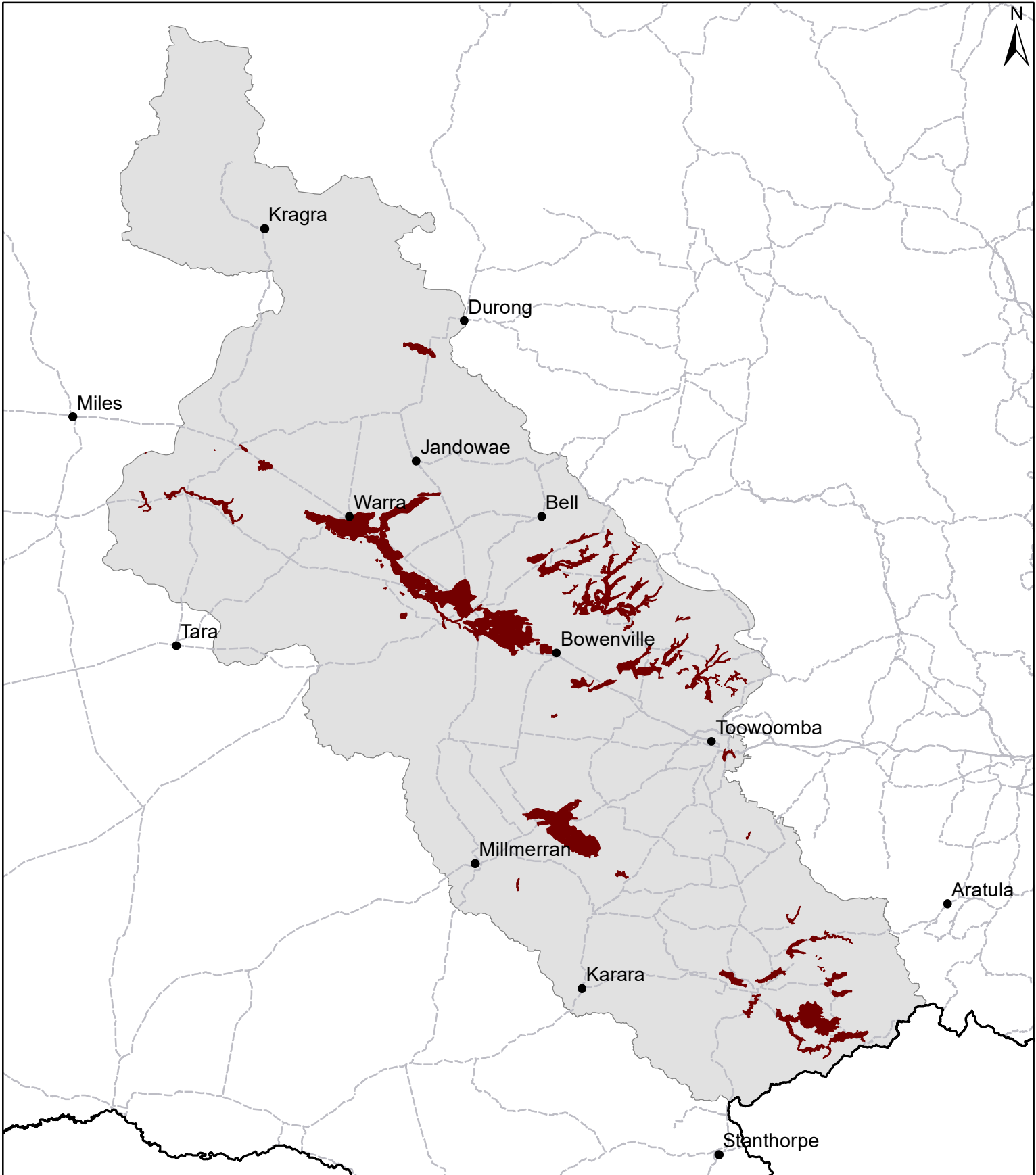
Regional Ecosystems

11.3.17, 11.3.2, 11.3.26, 11.3.4

Land units; Agricultural management unit; Soil associations

Central Darling Downs Land Management Manual: 2b (*Cecilvale*); Understanding and Managing the Soils in the Murilla, Tara and Chinchilla Shires: 1c (*Cecilvale*); Land Inventory and Technical Guide Eastern Downs Area: (*Cecilvale*).

DD13 Poplar box plains



Area of land type in region: 4%
Median rainfall (region): 580 – 909 mm
Average rainfall (region): 585 – 927 mm
Area of land type with FPC: 11%
Median FPC: 29%
Median TBA: 12 m²/ha



Queensland
Government

Poplar box uplands (Walloons)



Landform	Undulating rises and hills on Walloon sandstone.
Woody vegetation	Poplar box open woodland with occasional narrow-leaved ironbark and Queensland blue gum. Occasionally with an understorey of wilga.
Expected pasture composition	
Preferred	Forest bluegrass, Queensland bluegrass, black speargrass and kangaroo grass.
Intermediate	Pitted bluegrass, slender chloris, tall chloris and yabila grass.
Non-preferred	Wiregrass.
Common forbs and legumes	Cotton bush* (non-preferred).
Suitable sown pastures	Rhodes grass (Katambora types), digit grass, creeping bluegrass (Bisset) and Gatton panic. Lucerne, medics (barrel, burr, button) and woolly pod vetch.
Introduced weeds	African boxthorn, prickly pear, tiger pear and tree pear.
Soil	Deep, self-mulching dark or brown cracking clay with linear gilgai (vertosol, dermosol).
Description	Surface: finely self-mulching with moderate surface cracking; Surface texture: dark grey to black, light to medium heavy clay; Subsoil texture: dark to black with grey mottles, grading to yellowish brown or yellowish grey with depth.
Water availability	Moderate; plant available water capacity (PAWC) 100 – 150 mm, however, 60 – 70% of plant available water is held in top 45 cm of soil.
Rooting depth	
Fertility	Responds to phosphorus and nitrogen and perhaps sulphur and potassium.

Salinity Strongly saline at depth.
 Sodicity Strongly sodic at depth.
 pH Slightly acid topsoil (pH 6.5); strongly alkaline subsoil (pH 8.5)

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 582 – 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	3420 - 4200	30%	2.3 – 2.8
	13 TBA 31 FPC	1760 - 2770	30%	3.5 – 5.5
Sown			35%	

Enterprise

Growing and finishing.

Land use and management recommendations

- Excellent soil for germinating small seeds.
- Sulphur required to maintain sown species.

Land use limitations

- Susceptible to severe sheet, rill and gully erosion.
- Subsoils highly sodic and saline at depth.
- PAWC is limited by depth to sodic and saline subsoils.
- Shallow saline water tables and seepages may cause salinity at boundary between sandstone and basalt soils in mid to lower slope positions.

Conservation features and related management

- Conservation status of remnant vegetation is Of concern.
- Extensively cleared for cropping and pastures.

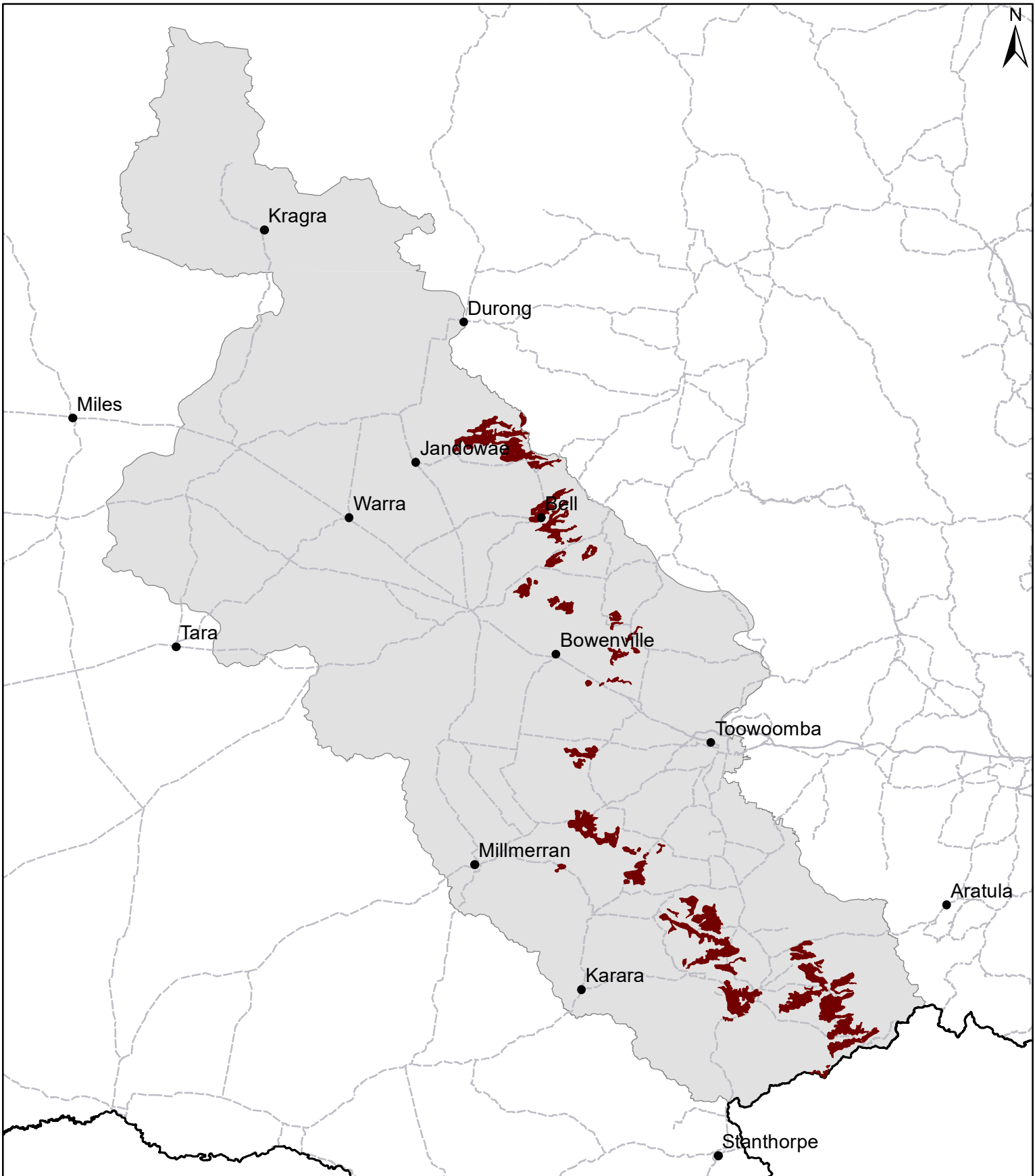
Regional Ecosystems

11.9.10, 11.9.13, 11.9.2, 11.9.3, 11.9.7

Land units; Agricultural management unit; Soil associations

Central Darling Downs Land Management Manual: 8a (*Elphinstone, Talgai*); Land Inventory and Technical Guide Eastern Darling Downs (*Junabee*); Description and Management of the Soils of the Eastern Darling Downs (*Canning, Elphinstone, Freestone, Jingarry, Talgai*).

DD14 Poplar box uplands



Area of land type in region: 3%
Median rainfall (region): 580 – 909 mm
Average rainfall (region): 585 – 927 mm
Area of land type with FPC: 21%
Median FPC: 31%
Median TBA: 13 m²/ha



Queensland
Government

Softwood scrub



Landform	Undulating to steep, low hills and rises.
Woody vegetation	Brigalow, belah, wilga open forest with poplar box and softwood scrub species such as bottle tree, crow's ash, peach bush, currant bush, quinine, bitterbark and ironwood. Occasional silver-leaved and narrow-leaved ironbark.
Expected pasture composition	* Denotes non-native "Expected Pasture Composition" species.
Preferred	Green panic* often dominates the softwood scrub land type on the Darling Downs; Queensland bluegrass, forest bluegrass and black speargrass often appear as soil fertility declines.
Intermediate	Pitted bluegrass and barbwire grass.
Non-preferred	Wiregrasses, green couch, urochloa* and slender bamboo grass.
Common forbs and legumes	Trefoils, glycine and rhynchosia. Cotton bush* (non-preferred).
Suitable sown pastures	Rhodes grass (Katambora types), Gatton panic, green panic, digit grass, creeping bluegrass (Bisset) and buffel grass in western areas. Lucerne, Caatinga stylo, desmanthus, leucaena and medics (barrel and button).
Introduced weeds	Tree pear, African boxthorn, African lovegrass, mother-of-millions and lantana.
Soil	Texture contrast soil with a hardsetting surface and impermeable subsoil (dermosol, chromosol).
Description	Surface: massive to weakly structured; Surface texture: dark brown to grey-brown, sandy loam to clay loam; Subsoil texture: brown, dark reddish brown, grey-brown or yellowish brown heavy to medium clay.
Water availability	Low to moderate; plant available water capacity (PAWC) 50 – 150 mm.
Rooting depth	20 – 40 cm.
Fertility	Low to moderate fertility; responds to nitrogen, phosphorus and copper and occasionally sulphur and potassium.

Salinity

Moderate at depth.

Sodicity

Sodic to strongly sodic in subsoils.

pH

Slightly acid pH 6.0 – 6.5 at surface; neutral to moderately alkaline at depth (pH 7.0 – 8.5)

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 582 – 729 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	4530 - 5070	30%	1.9 – 2.2
	16 TBA 39 FPC	1770 – 2730	30%	3.6 – 5.5
Sown			35%	

Enterprise

Growing and finishing.

Land use and management recommendations

- Easy to germinate seeds and establish pasture in this soil type.
- Responds quickly to small falls of rain and more productive than heavier clay soils in dry years.
- Persistently overgrazed patches are quickly overtaken by couch, increasing surface runoff and reducing water infiltration into the soil.
- Sulphur is required to maintain sown species.
- Low pH may cause nutrient imbalances.

Land use limitations

- PAWC is limited by depth to sodic/saline subsoils.
- Shallow depth.
- Rocky.
- Some soil types have a hardsetting surface.
- Susceptible to severe sheet and gully erosion.
- Marsupial overgrazing (particularly in cleared areas verging on forest).
- Woody weeds.
- Quinine, bitterbark, flannel weed, ironwood and sally wattle often encroach pastures.
- Green panic grazed continuously may lead to calcium deficiency.

Conservation features and related management

- Conservation status of remnant vegetation is endangered.
- Habitat for threatened fauna species including pale imperial hairstreak butterfly (*Jalmenus eubulus*).
- Protection from fire is necessary. Belah (*Casuarina cristata*) is fire sensitive, although germination can be good in bare areas. Brigalow (*Acacia harpophylla*) is soft-seeded, so germination is not promoted by fire.
- Maintain fire management of surrounding country so that wildfires will be very limited in extent. Frequent fire at the edge of this land type keeps fuel loads low.

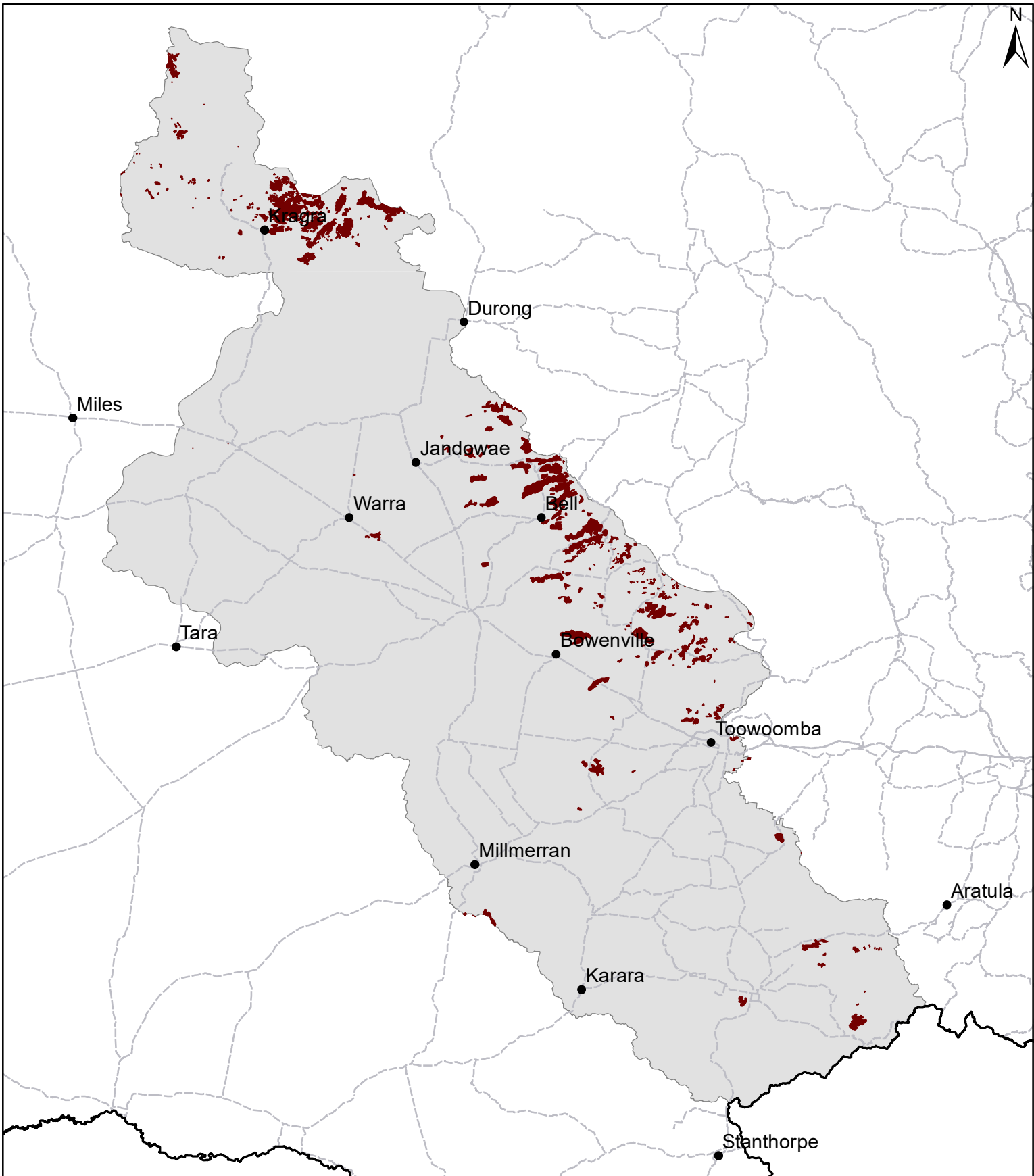
Regional Ecosystems

11.8.3, 11.9.4a, 11.9.4c, 11.9.5, 11.9.6, 12.5.13, 12.8.21

Land units; Agricultural management unit; Soil associations

Central Darling Downs Land Management Manual: 6b (*Clayburn, Diamondy, East, Toolburra, Walker*); Understanding and Managing Soils in the Murilla, Tara and Chinchilla Shires: 5c: (*Cadarga, Moola*). Land Inventory and Technical Guide Eastern Downs Area: (*Douglas, Emlyn, Norbell, Sugarloaf, Walker*); Description and Management of the Soils of the Eastern Darling Downs Queensland: (*Boundary, Toolburra*).

DD15 Softwood scrub



Area of land type in region: 2%
Median rainfall (region): 580 – 909 mm
Average rainfall (region): 585 – 927 mm
Area of land type with FPC: 40%
Median FPC: 39%
Median TBA: 16 m²/ha



Queensland
Government

Spotted gum and narrow-leaved ironbark hills and ridges



Landform	Plateaus, rocky hilltops and steep hill slopes.
Woody vegetation	Open forest of narrow-leaved ironbark, broad-leaved ironbark, blue-leaved ironbark, spotted gum, rusty gum with some cypress pine, poplar box and wattles.
Expected pasture composition	* Denotes non-native “Expected Pasture Composition” species.
Preferred	Barbwire grass and golden beard grass.
Intermediate	Pitted bluegrass, chloris grasses, curly windmill grass and limestone bottlewasher.
Non-preferred	Many-headed wiregrass, purple lovegrass and poverty grass.
Common forbs and legumes	Matrush and sida. Non-preferred species include mulga fern and cotton bush*.
Suitable sown pastures	Generally unsuitable for sown pastures. Rhodes grass (Katambora types), digit grass and Wynn cassia are best suited to this land type.
Introduced weeds	Tree pear, harrisia cactus, African lovegrass and prickly pear.
Soil	Self-mulching brown or black cracking clay (brown or black vertosol).
Description	Surface: Loose; Surface texture: loamy sand; Subsoil texture: loamy sand or decomposing rock.
Water availability	Very low; plant available water capacity (PAWC) <50 mm in root zone.
Rooting depth	Effective rooting depth 30 cm.
Fertility	Medium organic carbon and low nitrogen.

Salinity	Very low.
Sodicity	Non-sodic.
pH	Strongly acidic.

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 580 – 729 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	2770 - 3330	15%	5.8 – 7.0
	15 TBA 37 FPC	820 – 1440	15%	14 – 24

Enterprise

Breeding.

Land use and management recommendations

- Highly suited to timber production of valuable spotted gum.
- Narrow-leaved ironbark also may be useful farm and millable timber.
- Suitable for grazing native pastures.
- Clearing should be avoided; tree and grass cover will reduce runoff and soil loss.
- An active regrowth control program (e.g. selective chemical, burning every 3–5 years) may be required to maintain productivity levels.
- Good bee and native conservation country if not cleared.
- Non-cracking soil and underlying rock provide good foundations for buildings and structures.

Land use limitations

- Opportunities for cultivation are limited as soils are too steep, shallow and gravelly.
- Timber regrowth may limit productivity.
- Forest shade and infertility and acidity of soils may limit medic growth.

Conservation features and related management

- This land types provides habitat for insectivorous and nectivorous birds and mammals.
- Bullock seeds are an important food source for the vulnerable glossy black cockatoo.
- These open forests have not been extensively cleared for cultivation and provide wildlife with important links to other timbered areas. Design (e.g. strip as opposed to open park) and maintaining of timbered areas can allow connectivity of remnants through habitat corridors; provide firebreaks and shelter for stock; and greatly increase the value of these areas of land to wildlife and the overall health of the system.

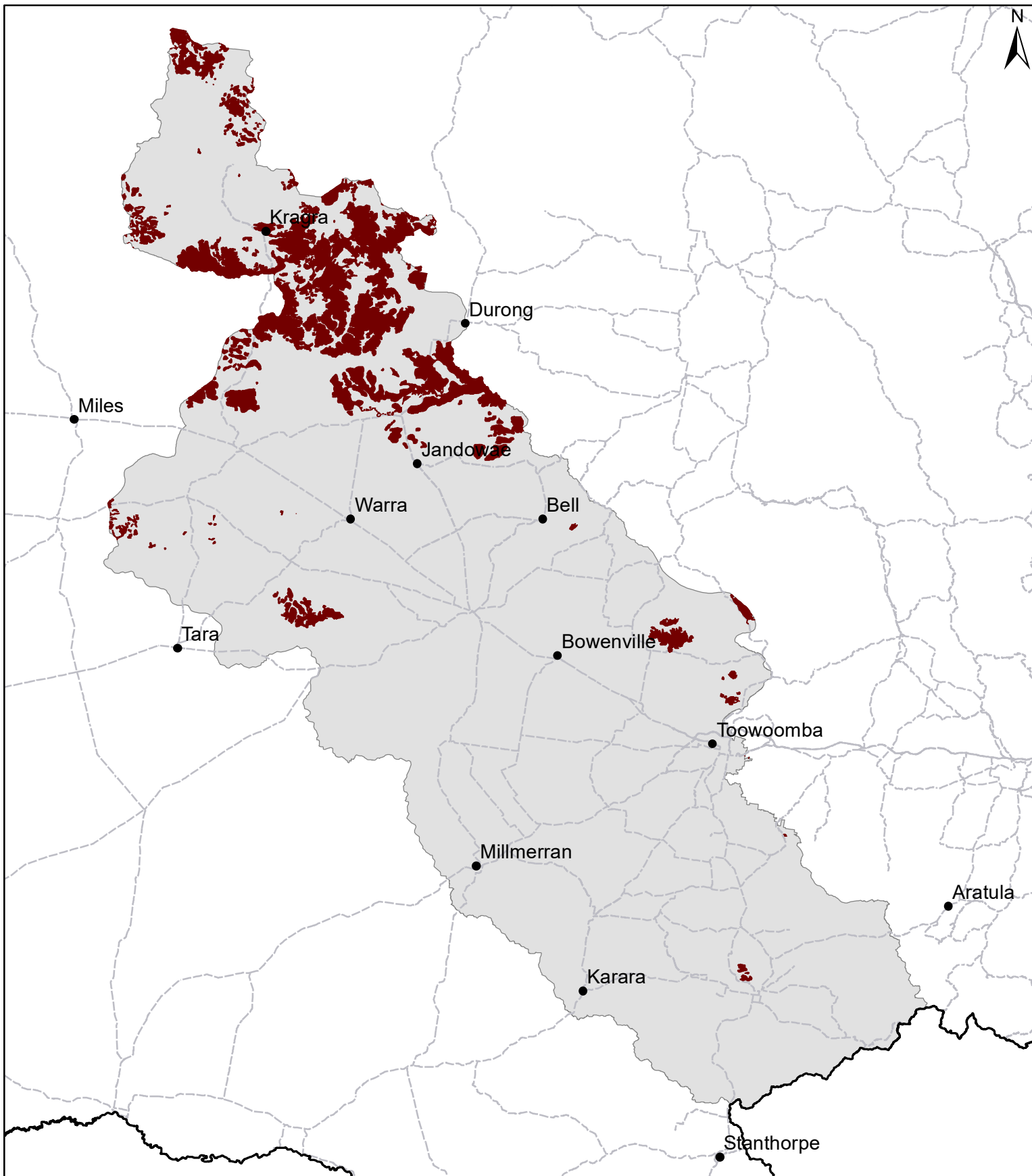
Regional Ecosystems

11.10.1, 11.10.1a, 11.10.7a, 11.7.4, 11.7.5, 11.7.6, 11.7.7, 12.9-10.19, 12.9.-10.2, 12.9-10.3, 12.9-10.5a, 12.9-10.5d

Land units; Agricultural management unit; Soil associations

Central Darling Downs Land Management Manual: 12b (*Drome, Knoll*); Understanding and Managing Soils in the Murilla, Tara and Chinchilla Shires: 9b, 9c (*Minnabilla*). Understanding and Managing Soils in the Stanthorpe – Rosenthal Region: Gently undulating sandy rises (*Drome*); Land Inventory and Technical Guide Eastern Downs Area: (*Bony, Drome, Knoll, Wattle Glen*); Description and Management of the Soils of the Eastern Darling Downs Queensland: (*Drome, AMU 6*).

DD16 Spotted gum and narrow-leaved ironbark hills and ridges

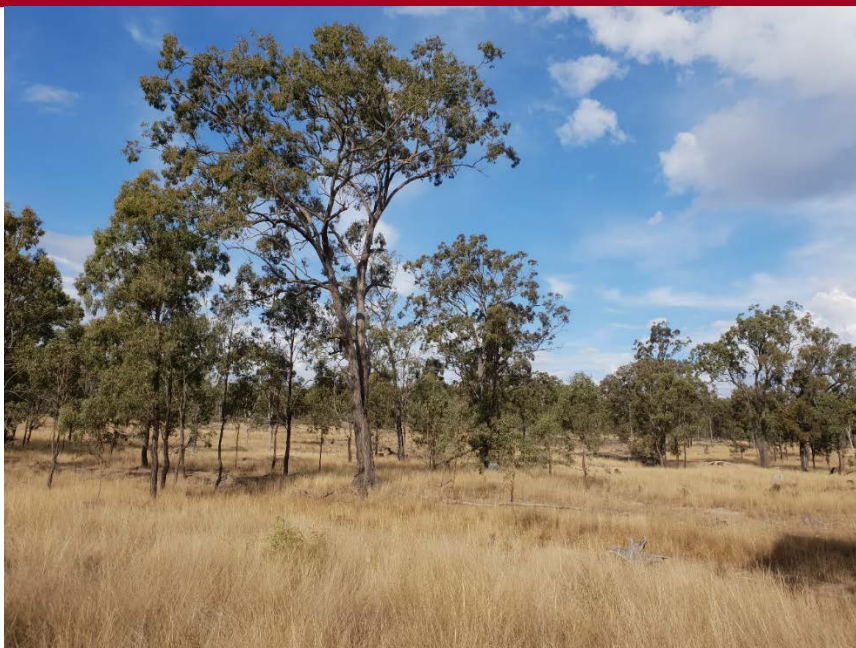


Area of land type in region: 7%
Median rainfall (region): 580 – 909 mm
Average rainfall (region): 585 – 927 mm
Area of land type with FPC: 89%
Median FPC: 37%
Median TBA: 15 m²/ha



Queensland
Government

Traprock hills



Landform	Undulating low traprock hills, isolated traprock knolls and ridges.
Woody vegetation	Layered open forest of ironbark (narrow-leaved, dusky-leaved, mugga or broad-leaved red), grey box and yellow box with occasional fuzzy box, tumbledown gum, cypress pine and an understorey of wild rosemary and wattles.
Expected pasture composition	* Denotes non-native "Expected Pasture Composition" species.
Preferred	Queensland bluegrass, barbwire grass, wallaby grass, weeping grass, paspalum*.
Intermediate	Pitted bluegrass, windmill grass, hairy panic and rough speargrass.
Non-preferred	Purple wiregrass, dark wiregrass, many-headed wiregrass, shorthair plume grass, hedgehog grass, five-minute grass and slender bamboo grass.
Common forbs and legumes	Cluster clover*, hare's foot clover*, glycine and desmodium.
Suitable sown pastures	Digit grass and forest bluegrass (Swann). Barrel and burr medics (pH >6), rose clover, cluster clover, subclovers, lucerne and biserrula.
Introduced weeds	African lovegrass, coolatai grass, tree pear and prickly pear.
Soil	Very shallow to shallow, gravelly, clay loams. Gradational and texture contrast soils (kandasol, sodosol).
Description	Surface: Hard-setting and gravelly hard-setting; Surface texture: loams to clay loams; Subsoil texture: grey clay loam, bleached when dry, grading to weathered rock between 30–40 cm.
Water availability	Very low; plant available water capacity (PAWC) <50 – 100 mm.
Rooting depth	Shallow; 20 – 30 cm or depth to rock.
Fertility	Very low. Responds to nitrogen, phosphorus, copper, and zinc.
Salinity	Low to high salinity.
Sodicity	Subsoil moderately to strongly sodic.
pH	Medium acid to mildly alkaline (pH 6.0 – 7.5).

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 628 – 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	2150	20%	6.8
	13 TBA 31 FPC	730 - 1270	20%	12 – 20

Enterprise

Land use and management recommendations

Cattle and sheep breeding, wool production and bee keeping.

- This soil is best left undeveloped and in its native state – suitable for native pastures only. Limited suitability for grazing sown pastures on lower slopes.
- Ensure there is a regrowth management when clearing.
- Strategically place water points to avoid areas of overgrazing, use centrally located watering points (1 water point per 200 ha) – scalding may become a problem when there are insufficient, or badly located, watering points.
- In poor run-down pastures, on-going supplementation will be required for weaner growth and development as pasture alone is unlikely to provide sufficient nutrients.
- On areas with gentle slopes and deeper A horizons, use fully prepared seedbeds with superphosphate application (150 kg/ha) to establish sown pastures.
- Top-dress sown pastures with 100 kg/ha of superphosphate after two years.
- If band-seeding, use a chisel plough with narrow points along the contour.
- Good bee and nature conservation country if not cleared.
- Generally not suited to intensive livestock due to potential for contamination of ground water through underlying permeable rock.
- Ironbark only of medium quality (hollow or cracks), may be useful farm timber.
- Protect as valuable watershed country.

Land use limitations

- Steep topography, high erosion risk due to steep slopes.
- Hard-setting surface, shallow rooting depth, stoniness and rockiness.
- Waterlogging, depending on slope.
- Overgrazed areas susceptible to scalding.
- Regrowth, particularly of eucalypt, wattle and wild rosemary when cleared.

Conservation features and related management

- Extensively cleared or thinned for pasture leaving this land type highly fragmented.
- Localised occurrences of *Eucalyptus terrica*, the mallees (*E. bakeri*, *E. viridis*) and *Melaleuca decora*.
- Habitat fragments, particularly with honeyeater nesting sites, should be retained to develop a network of wildlife corridors. Conservation value of these habitat corridors could be enhanced through controlled grazing to allow for the retention of ground vegetation and cover, and encourage regeneration of favoured habitat trees.
- Habitat for threatened fauna, regent honeyeater *Xanthomyza phrygia*. Localised occurrences of *Eucalyptus bakeri*, *E. viridis* (mallees) and *Melaleuca decora*.

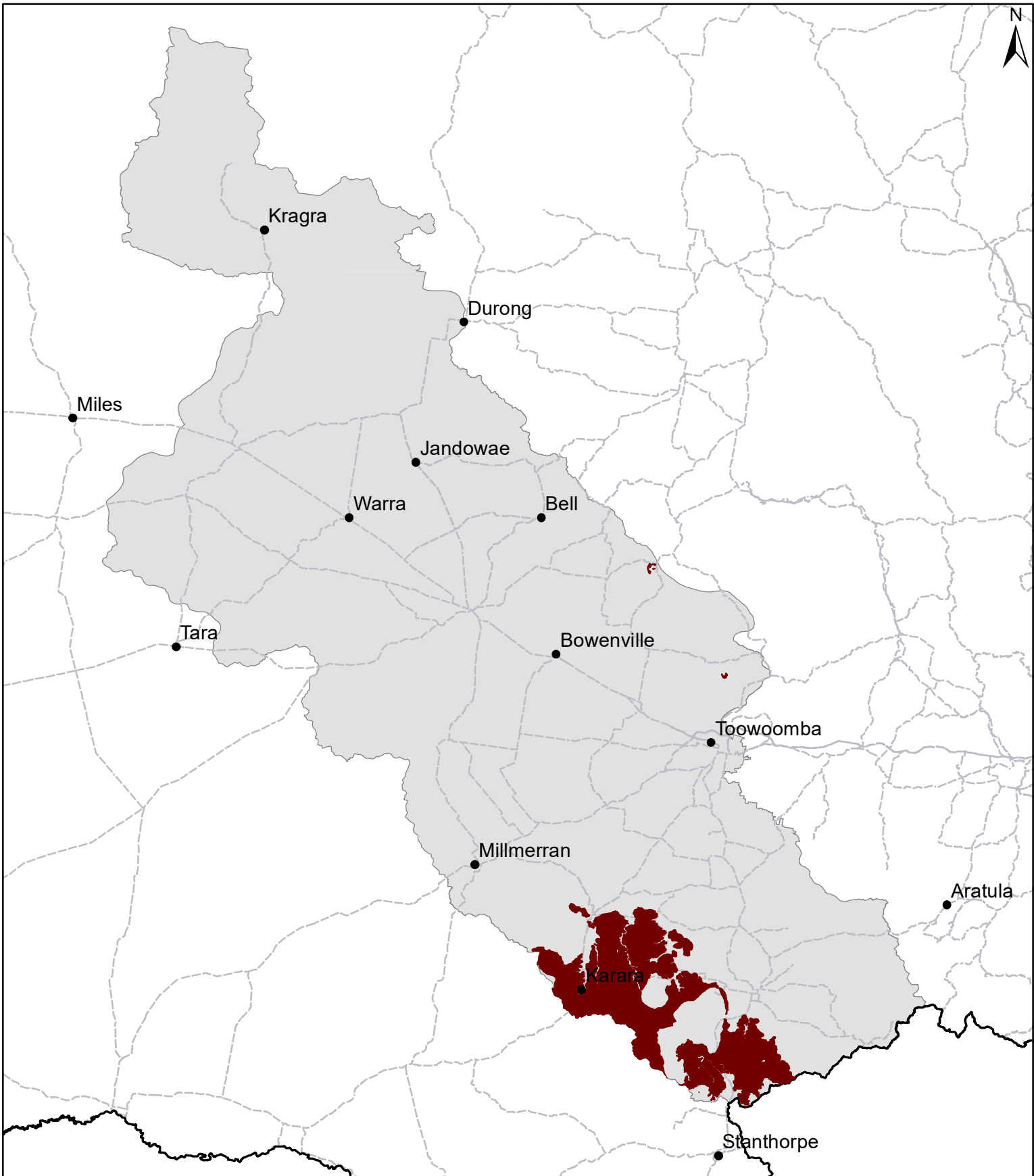
Regional Ecosystems

12.8.26, 13.11.1, 13.11.3, 13.11.3a, 13.11.5, 13.11.6, 13.11.8, 13.12.4, 13.3.6

Land units; Agricultural management unit; Soil associations

Central Darling Downs Land Management Manual: 14a (*Gammie, Karangi*); Understanding and Managing Soils in the Stanthorpe-Rosenthal Region: Traprock mountains, Undulating to rolling traprock hills, Low traprock hills and Traprock plains (*Gammie, Karangi*); Land Inventory and Technical Guide Eastern Downs Area (*Silverwood, Thane*).

DD17 Traprock hills



Area of land type in region: 5%
Median rainfall (region): 580 – 909 mm
Average rainfall (region): 585 – 927 mm
Area of land type with FPC: 78%
Median FPC: 31%
Median TBA: 13 m²/ha



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