

Mackay Whitsunday Region Plant Index

Common name	Scientific name	Page
Aleman grass*	<i>Echinochloa polystachya</i> cv. Amity	MW05
Alysicarpus	<i>Alysicarpus</i> spp.	MW02, MW08
Angleton grass*	<i>Dicanthium aristatum</i> cv. Floren	MW01, MW02, MW08
barnyard grass	<i>Echinochloa</i> spp.	MW03, MW05
black ironbox	<i>Eucalyptus raveretiana</i>	MW05
black speargrass	<i>Heteropogon contortus</i>	MW01, MW02, MW04, MW06, MW08
black tulip oak	<i>Argyrodendron polyandrum</i>	MW09
blady grass	<i>Imperata cylindrica</i>	MW01, MW02, MW04, MW06, MW08
blue gum	<i>Eucalyptus saligna</i>	MW01, MW03, MW05
bluegrass	<i>Bothriochloa</i> spp.	MW01, MW04
broad-leaved tea tree	<i>Melaleuca viridiflora</i>	MW02, MW04
bull oak	<i>Hakea chordophylla</i>	MW04
bulrushes	<i>Typha domingensis</i>	MW03, MW05
bumpy/silver ash	<i>Flindersia schottiana</i>	MW03
cabbage gum	<i>Corymbia confertiflora</i>	MW02
cabbage palm	<i>Livistona decipiens</i>	MW04, MW05
centro*	<i>Centrosema molle</i> cvv. Cardillo	MW03, MW04
clovers*	<i>Trifolium</i> spp.	MW09
creeping bluegrass*	<i>Bothriochloa insculpta</i> cvv. Bisset, Hatch	MW01, MW02, MW03, MW06, MW08
creeping vigna*	<i>Vigna parkeri</i> cv. Shaw	MW09
<i>Desmodium</i>	<i>Desmodium muerelli</i>	MW02, MW08
devil's fig	<i>Solanum torvum</i>	MW02, MW04, MW08
flannel weed	<i>Sida cordifolia</i>	MW02, MW04, MW08
flooded gum	<i>Eucalyptus grandis</i>	MW09
forest bluegrass	<i>Bothriochloa bladhii</i>	MW01, MW02, MW06, MW08

Common name	Scientific name	Page
forest siris	<i>Albizia procera</i>	MW03
fringe rush	<i>Fimbristylis littoralis</i>	MW07
giant rat's tail grass*	<i>Sporobolus pyramidalis</i>	MW01, MW02, MW04, MW06, MW08, MW09
giant black speargrass	<i>Heteropogon triticeus</i>	MW01, MW04
glycine	<i>Glycine</i> spp.	MW02, MW08
golden beard grass	<i>Chrysopogon fallax</i>	MW02, MW04, MW06, MW08
grader grass*	<i>Themeda quadrivalvis</i>	MW02, MW04, MW08
grasstree	<i>Xanthorrhoea johnsonii</i>	MW04
green panic*	<i>Panicum maximum</i> var. <i>trichoglume</i>	MW02, MW06, MW08
grevillea	<i>Grevillea</i> spp.	MW04
grey ironbark	<i>Eucalyptus creba</i> (includes <i>E. drepanophylla</i>)	MW02, MW06
guinea grass*	<i>Megathyrsus maximus</i> (Syn. <i>Panicum maximum</i>)	MW03
hoop pine	<i>Araucaria cunninghamii</i>	MW09
hymenachne*	<i>Hymenachne amplexicaulis</i> cv. Olive	MW05, MW07
Indian bluegrass	<i>Bothriochloa pertusa</i>	MW02, MW06
joint-vetch*	<i>Aeschynomene americana</i> ; <i>A villosa</i>	MW01, MW02, MW03, MW04, MW05, MW06, MW08
kangaroo grass	<i>Themeda triandra</i>	MW01, MW02, MW04, MW06, MW08
kikuyu grass*	<i>Pennisetum clandestinum</i>	MW09
lantana*	<i>Lantana camara</i>	MW01, MW02, MW06, MW08, MW09
Leichhardt tree	<i>Nauclea orientalis</i>	MW05
Mackay cedar	<i>Paraserianthes toona</i>	MW03, MW09
mangrove	<i>Avicennia marina</i>	MW07
marine couch see also salt couch, sand couch	<i>Sporobolus virginicus</i>	MW03, MW05, MW07
melaleuca/tea tree	<i>Melaleuca</i> spp.	MW05, MW07
Moreton Bay ash	<i>Corymbia tessellaris</i>	MW01, MW02, MW03, MW08
narrow-leaf mat grass*	<i>Axonopus affinis</i>	MW09

Common name	Scientific name	Page
narrow-leaved ironbark	<i>Eucalyptus crebra</i>	MW02, MW04
noogoora burr*	<i>Xanthium occidentale</i>	MW02, MW04, MW08
pandanus	<i>Pandanus</i> sp.	MW05
pangola grass*	<i>Digitaria eriantha</i> subsp. <i>pentzii</i> cv. Pangola	MW01, MW03, MW04, MW05
para grass*	<i>Brachiaria mutica</i>	MW05, MW07
peach cedar	<i>Trema orientalis</i>	MW03
pink bloodwood	<i>Corymbia intermedia</i>	MW02, MW04, MW06, MW08
pitted bluegrass	<i>Bothriochloa decipiens</i>	MW02, MW06, MW08
poplar gum	<i>Eucalyptus platyphylla</i>	MW02, MW06, MW08
poverty grass	<i>Eremochloa bimaculata</i>	MW04
purple top chloris	<i>Chloris inflata</i>	MW02, MW06, MW08
quandong	<i>Elaeocarpus grandis</i>	MW09
red cedar	<i>Toona ciliata</i>	MW09
red Eungella satinash	<i>Acmena resa</i>	MW09
red kamala	<i>Mallotus phillipensis</i>	MW03
reedgrass	<i>Arundinella nepalensis</i>	MW03, MW05
reeds	<i>Phragmites australis</i>	MW03, MW05
Rhodes grass*	<i>Chloris gayana</i> cv. Callide	MW01, MW02, MW03, MW04, MW08, MW09
rose gum	<i>Eucalyptus grandis</i>	MW09
round leaf Wynn cassia*	<i>Chamaecrista rotundifolia</i> cv. Wynn	MW02, MW06
salt water couch*	<i>Paspalum vaginatum</i>	MW03, MW05, MW07
samphire	<i>Halosarca indica</i>	MW07
sand couch		
salt couch see also marine couch	<i>Sporobolus virginicus</i>	
scrub cherry	<i>Syzygium australe</i>	MW09
sedges	<i>Cyprus</i> spp.	MW01, MW03, MW04, MW05, MW07

Common name	Scientific name	Page
setaria	<i>Setaria sphacelata</i> var. <i>anceps</i> cvv. Kazungula, Nandi, Norok, Solander, Splenda	MW04, MW09
sicklepod	<i>Senna obtusifolia</i>	MW01
sida	<i>Sida</i> spp.	MW02, MW04, MW08
signal grass*	<i>Brachiaria decumbens</i>	MW01, MW02, MW03, MW04, MW08
snakeweed	<i>Stachytarpheta</i> sp.	MW02, MW04, MW06, MW08
sourgrass*	<i>Paspalum conjugatum</i>	MW03, MW05
<i>Sporobolus</i> grasses	<i>Sporobolus</i> spp.	MW08, MW09
Stylo*	<i>Stylosanthes guianensis</i> var. <i>guianensis</i> ; <i>S. hamata</i> ; <i>S. scabra</i> ; <i>S. seabrana</i>	MW01, MW02, MW04, MW06, MW08
summer grass	<i>Digitaria ciliaris</i>	MW01, MW02, MW06, MW08
swamp mahogany	<i>Lophostemon suaveolens</i>	MW03, MW08
thatch grass*	<i>Hyparrhenia rufa</i>	MW01, MW02, MW04, MW08
Tully grass*	<i>Brachiaria humidicola</i> cv. Tully	MW01, MW02, MW03, MW04, MW05, MW08
urena/pink burr	<i>Urena</i> sp.	MW02, MW04, MW08
<i>Vigna</i>	<i>Vigna</i> sp.	MW02, MW08
water couch	<i>Paspalum distichum</i>	MW03, MW05, MW07
weedy <i>Sporobolus</i> grasses*	<i>Sporobolus pyramidalis</i> , <i>S.</i> <i>natalensis</i> , <i>S. fertilis</i> , <i>S. africanus</i> , <i>S. jacquemontii</i> .	MW01, MW02, MW04, MW05, MW06
white cedar	<i>Melia azedarach</i>	MW03, MW09

* Denotes non-native species

Alluvial flats and plains



Description	Small to large creek flats that are frequently flooded.
Landform	Alluvial creek flats and levees.
Woody vegetation	Most of these areas may have been originally rainforest with some blue gum and Moreton Bay ash. Disturbed areas tend to have regrowth of eucalypts, especially where fire is used.
Expected pasture composition	<i>Originally black speargrass and blady grass native pasture communities.</i> * Denotes non-native "Expected Pasture Composition" species.
Preferred	Black speargrass, forest bluegrass, kangaroo grass, giant black speargrass.
Intermediate	Bluegrasses.
Non-preferred	Blady grass.
Annual grasses	Summer grass on disturbed areas.
Common forbs	Sedges.
Suitable sown pastures	Rhodes grass, signal grass, creeping bluegrass, pangola grass, Tully grass. Angleton grass has naturalised many lower clay soils areas. Stylo and joint-vetch.
Introduced weeds	Introduced weedy <i>Sporobolus</i> grasses, including giant rat's tail (potential), sicklepod, general broad leaf weeds, thatch grass, lantana.
Soil	Deep soil with a sandy to loam to light clay topsoil over a grey to brown sand to sandy loam to clay subsoil. The soil types include rudosols and dermosols.
Description	Surface: Firm; Surface texture: sandy to loam to light clay; Subsoil texture: sandy loam to light clay.
Water availability	Moderate to high.
Rooting depth	1 m

Fertility
Salinity
Sodicity
pH

Moderate to high total nitrogen, moderate to high phosphorous.
Low
Low
Surface slightly acid to neutral; subsoil clays – acid to neutral.

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 1156– 1690 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	4420 - 5590	50% (sown)	1.0 – 1.3
	21 TBA 49 FPC	< 1190 - 2410	50% (sown)	> 2.4 – 4.9

Enterprise

Finishing

Land use and management recommendations

- Suitable for pasture improvement (much used for cane growing).
- Retain trees on bed and bank of streams; potential for agro-forestry.
- Best to fence separately less fertile land types to avoid over-grazing.
- Maintain good pasture cover to avoid erosion during flooding.
- Use off stream watering points for cattle grazing.

Land use limitations

- Flooding and water logging on clay soils.
- Restricted access in wet conditions.

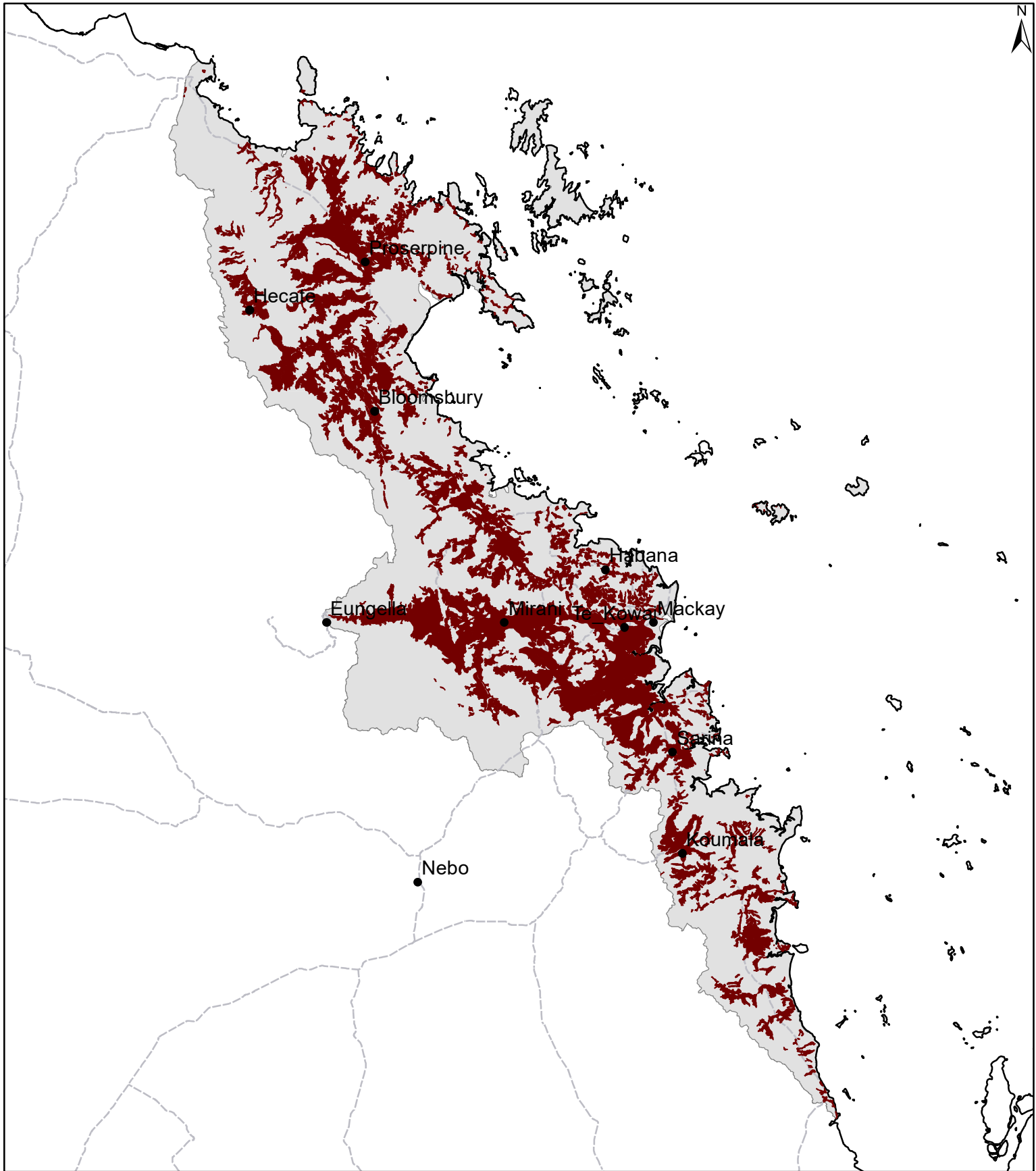
Conservation features and related management

- The large gum trees, particularly those that are hollow bearing, provide important habitat and nesting sites for arboreal marsupials (e.g. greater gliders), raptors (e.g. boobook, barn owls, white-bellied sea eagles, kites, goshawks parrots, cockatoos). These gums trees are important food trees for koalas and greater gliders in the region.
- Blue gum trees flower regularly and reliably, providing a major blossom and nectar source for sugar gliders, nectareous birds, fruit bats and bees.
- Seed eating birds make use of the frontage grasses for food and shelter (e.g. manikins, finches, doves).
- This riparian vegetation is an important corridor for migrating wildlife, often forming the only connecting corridor in the landscape.
- These land types also provide habitat for a range of freshwater fish (e.g. Saratoga), water rats, and platypus.
- Regeneration of blue gum forests may be encouraged by fencing off to prevent cattle from grazing seedlings.
- Low disturbance and low usage of fire in these areas is recommended as weed infestations readily establish in flood events.

Regional Ecosystems

7.3.19i, 7.3.40, 8.3.1a, 8.3.5, 8.3.6a, 8.3.10, 8.3.15.

MW01 Alluvial flats and plains



Area of land type in region: 21%
Median rainfall (region): 631 – 1690 mm
Average rainfall (region): 736 – 1808 mm
Area of land type with FPC: 23%
Median FPC: 49%
Median TBA: 21 m²/ha



Coastal eucalypt forests and woodlands



Description	Gravelly and low fertility soils on hill slopes that support eucalypt woodlands (below 700 m).
Landform	Undulating and low hills.
Woody vegetation	Narrow-leaved ironbark, grey ironbark, cabbage gum, pink bloodwood, Moreton Bay ash, poplar gum woodlands with occasional patches of broad-leaved tea tree.
Expected pasture composition	<i>Originally black speargrass and blady grass native pasture communities.</i> <i>* Denotes non-native "Expected Pasture Composition" species.</i>
Preferred	Black speargrass, some forest bluegrass, kangaroo grass.
Intermediate	Pitted bluegrass, golden beard grass.
Non-preferred	Blady grass, purpletop chloris*.
Annual grasses	Summer grass.
Common forbs	Low level of native legumes present (<i>Desmodium, Glycine, Vigna, Alysicarpus</i>).
Suitable sown pastures	Rhodes grass, green panic, signal grass, Tully grass, creeping bluegrass, Indian bluegrass, Angleton grass. Stylo, joint-vetch, round-leaf Wynn cassia.
Introduced weeds	Introduced weedy <i>Sporobolus</i> grasses (including giant rat's tail), lantana. General broad leaf weeds (including devil's fig, sida and flannel weed, urena/pink burr, and Noogoora burr, snakeweed), grader and thatch grass.
Soil	Shallow to moderately deep soil of mostly acid and intermediate volcanic rock origin. The dominate soil types are chromosol, sodosol and rudosol.
Description	Surface: Firm to hard-setting; Surface texture: dark sand to loam; Subsoil texture: Grey to brown clay (where present).

Water availability

Low to moderate.

Rooting depth

30 cm–60 cm.

Fertility

Low to moderate.

Salinity

Low to moderate (when cleared, often salinity outbreaks at foot slope).

Sodicity

Non-sodic to mildly sodic.

pH

Neutral to acid.

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 1156 – 1690 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	4520 - 5660	30%	1.7 – 2.2
	19 TBA 45 FPC	1420 - 2420	30%	4.0 – 6.9
Sown			35%	

Enterprise

Breeding, growing and fattening possible in limited areas with high fertiliser inputs.

Land Use and Management Recommendations

- Moderate to high fertiliser inputs required to maintain high productive sown pastures.
- Woody regrowth control could be required in cleared areas.
- Where stylo and Wynn cassia legumes are sown, careful grazing management is required to prevent legume dominance.

Land use limitations

- Low soil phosphorous.
- Moderate to high erosion risk.

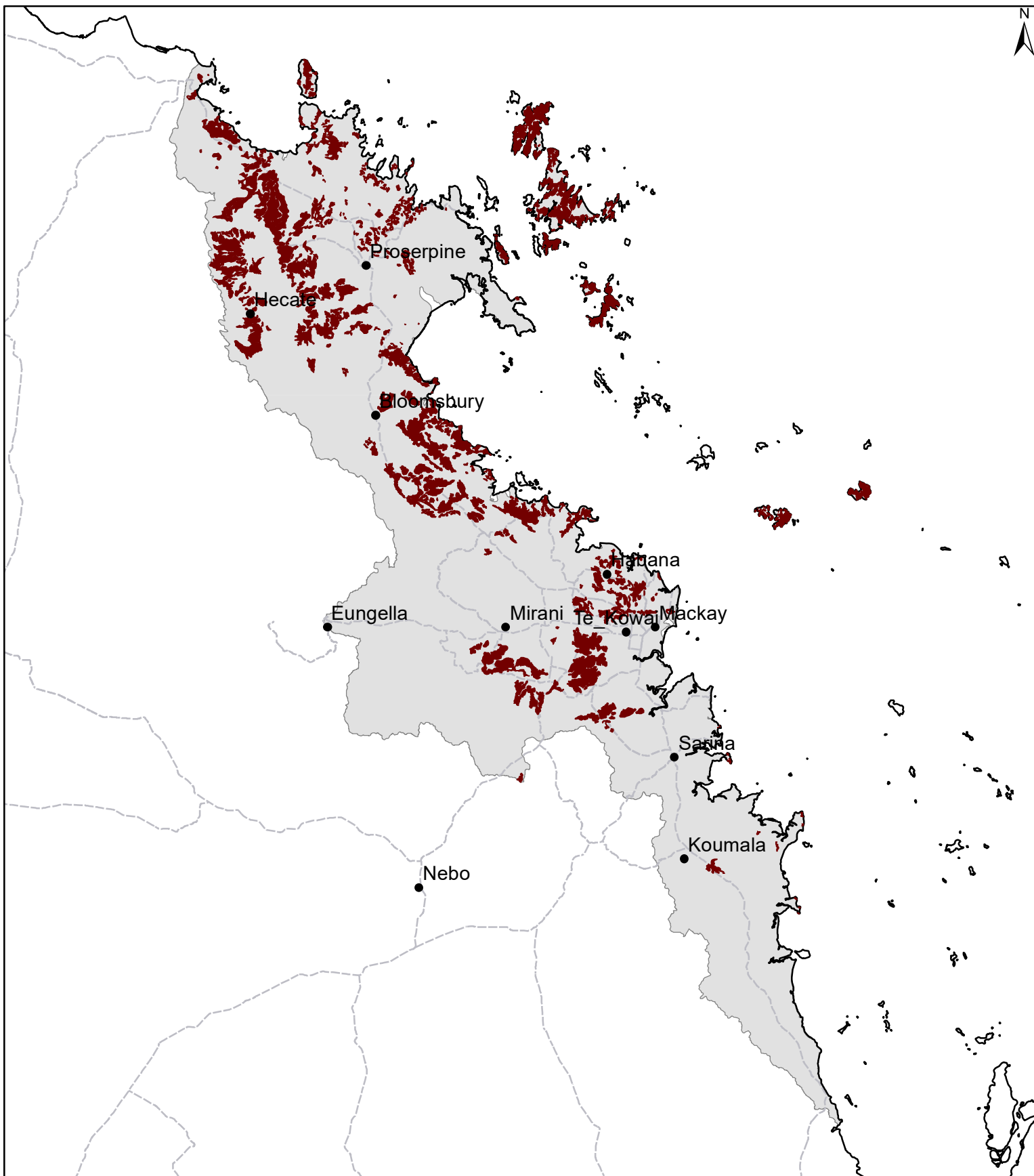
Conservation features and related management

- These land types provide important habitat for significant fauna species including northern quoll, grey goshawk, beach thick-knee, squirrel gliders, red-tail black cockatoos and orange-footed scrub fowl.
- Use of an appropriate fire regime to maintain vegetation community and structure, including protection of standing hollow trees (alive and dead) and hollow logs on the ground is recommended.

Regional Ecosystems

7.11.16a-d, 7.11.37b, 7.11.43, 7.12.12a-b, 7.12.4, 7.12.53a-e, 7.12.53g, 7.12.54a-c, 7.12.54e, 7.12.65i, 8.3.13d, 8.5.1a-b, 8.5.3a-b, 8.11.1, 8.11.4, 8.11.10, 8.12.13a-b, 8.12.13, 8.12.14a-c, 8.12.20a, 8.12.25, 8.12.26, 8.12.27a, 8.12.29, 8.12.29a-b, 11.3.32.

MW02 Coastal eucalypt forests and woodlands



Area of land type in region: 10%
Median rainfall (region): 631 – 1690 mm
Average rainfall (region): 736 – 1808 mm
Area of land type with FPC: 57%
Median FPC: 45%
Median TBA: 19 m²/ha



**Queensland
Government**

Coastal rainforests



Description	Upper slopes and drainage lines of low coastal hills with remnant or regenerating rainforest (elevation less than 500 m).
Landform	Coastal low hills and drainage lines.
Woody vegetation	Rainforest (vine forest) vegetation including; white, Mackay and peach cedars, bumpy/silver ash, red kamala, forest siris. Blue gum, swamp mahogany and Moreton Bay ash occur on fringes.
Expected pasture composition	<i>Originally sparse or absent native pasture community. Much of this land type has been developed for sugar cane and sown pastures for grazing.</i> * Denotes non-native "Expected Pasture Composition" species.
Preferred	Water couch, marine couch, salt water couch*.
Intermediate	
Non-preferred	Reedgrass, sourgrass*.
Annual grasses	Barnyard grasses.
Common forbs	Sedge. Non-preferred species include bulrushes, reeds.
Suitable sown pastures	Rhodes grass, signal grass, creeping bluegrass, Tully grass, pangola grass, joint-vetch, centro (climbing legume). Cleared areas not planted to sown pastures, or following pasture rundown, have now been colonised by guinea grass.
Introduced weeds	Susceptible to general broad leaf and grass weeds depending on pasture and grazing management.
Soil	Shallow to moderately deep, gradational to uniform soil. Less than 0.6 m deep. The soil types include brown dermosols and chromosols.
Description	Surface: Firm; Surface texture: 20–30 cm thick clay loam to light clay; Subsoil texture: brown to reddish-brown clay subsoil.
Water availability	Moderate to high (55–70 mm).

Rooting depth	55 cm
Fertility	High; phosphorus levels can be variable.
Salinity	Low
Sodicity	Low
pH	Slightly acid to neutral.

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 1156 – 1690 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	6260 - 8000	50% (sown)	0.7 – 0.9
	35 TBA 74 FPC	< 2480 - 3850	50% (sown)	> 1.5 – 2.4

Enterprise

Land use and management recommendations

Finishing

- Suitable for pasture improvement (depending on topography).
- Areas are generally used for cane growing.
- Retain trees on bed and bank of streams, and slopes more than 20%.
- Potential for selective removal of suitable timber trees.
- Include fences that separate these land types from less fertile ones to avoid over-grazing.
- Maintain good pasture cover to avoid gully erosion during high rainfall periods.
- Use off-stream watering points for cattle grazing where possible.

Land use limitations

- Steep slopes (<20%) can limit pasture development.
- Vegetation status should be checked before development.
- Soils can be erodible on steeper slopes.

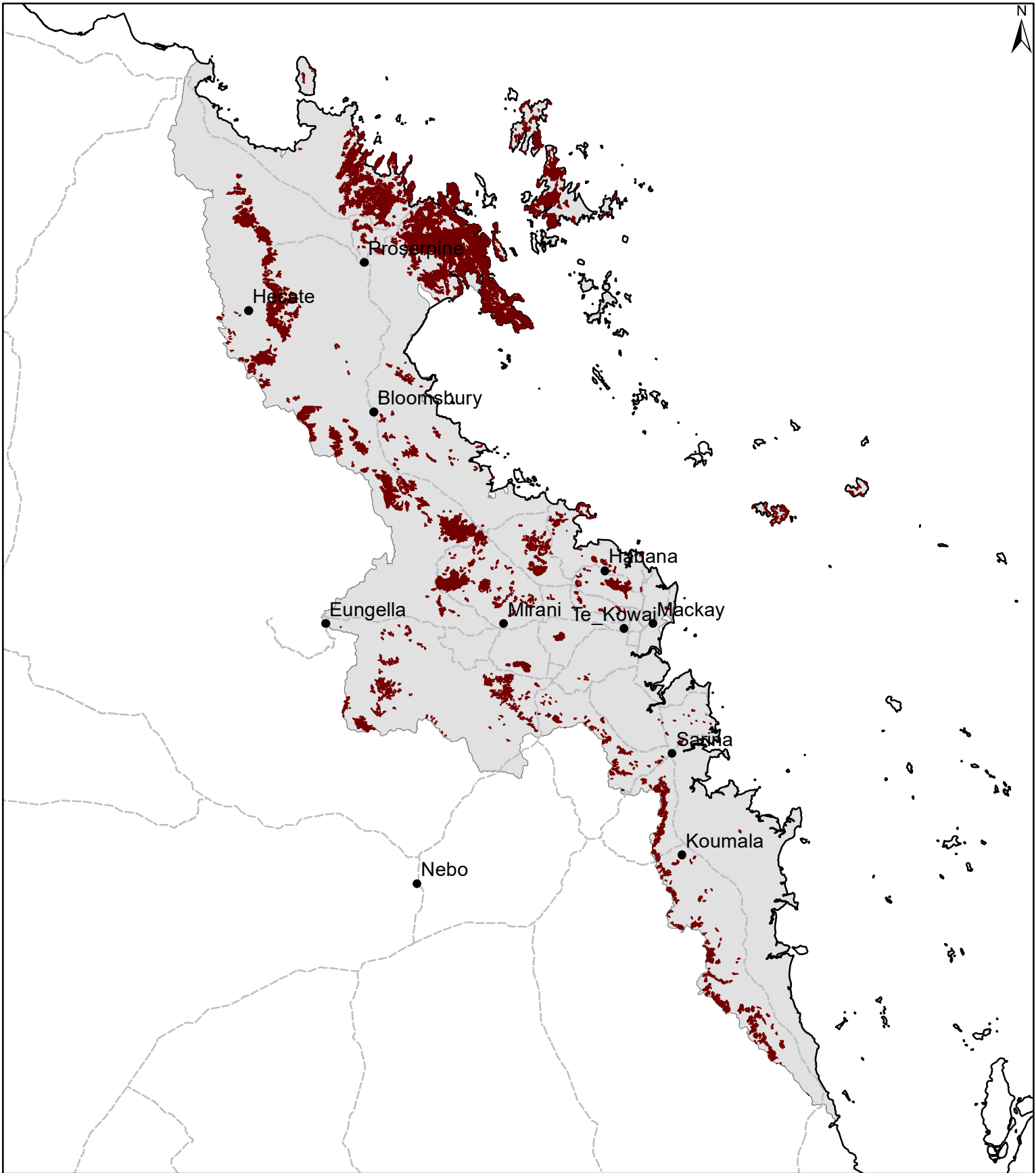
Conservation features and related management

- High conservation values where existing rainforest vegetation remains.
- Habitat for threatened fauna including rufous owl, Proserpine rock wallaby, burrowing skink, endemic ground-dwelling lizards and endemic leaf-tail geckos.
- There are a number of plant species that are also listed as endangered, vulnerable and rare.
- Grazing exclusion area. Protect community edges from fire encroachment.

Regional Ecosystems

7.11.24a, 7.11.46, 7.12.10a-b, 7.12.11a-b, 7.12.11d, 7.12.1a, 7.12.1e, 7.12.2a, 7.12.39a, 7.12.40a-d, 7.12.42a-b, 7.8.11a, 7.8.1a, 7.8.1c, 8.2.14, 8.3.9, 8.8.1b, 8.11.2, 8.11.2.x1a, 8.12.11, 8.12.3a, 8.12.11a, 8.12.18, 8.12.19, 8.12.28.

MW03 Coastal rainforests



Area of land type in region: 9%
Median rainfall (region): 631 – 1690 mm
Average rainfall (region): 736 – 1808 mm
Area of land type with FPC: 95%
Median FPC: 74%
Median TBA: 35 m²/ha



**Queensland
Government**

Coastal tea tree plains



Description	Very low fertility, flat to undulating land with a sandy surface that supports mostly tea tree and patches of bull oak.
Landform	Flat to slightly undulating coastal plains with relic terrace flats to slightly elevated peneplains.
Woody vegetation	Broad-leaved tea tree, pink bloodwood, narrow-leaved ironbark, cabbage palm and small areas of bull oak and grevillea. Occasionally a grasstree understorey.
Expected pasture composition	<i>Originally black speargrass native pasture community, with smaller areas of blady grass and low density of native legumes.</i> <i>* Denotes non-native "Expected Pasture Composition" species.</i>
Preferred	Golden beard grass, black speargrass, kangaroo grass.
Intermediate	Bluegrasses, giant black speargrass.
Non-preferred	Blady grass, poverty grass.
Annual grasses	Summer grass.
Common forbs	Sedges.
Suitable sown pastures	Pangola grass, Tully grass, signal grass, Rhodes grass, setaria, joint-vetch, stylo, centro.
Introduced weeds	Introduced weedy <i>Sporobolus</i> grasses, (including giant rat's tail), broad leaf weeds (including devil's fig, sida and flannel weed, urena/pink burr, Noogoora burr, snakeweed), grader and thatch grass.
Soil	Shallow to deep soil with a sandy loam topsoil over a grey to yellow clay. The dominant soil types are sodosols.
Description	Surface: Hard-setting; Surface texture: Sandy to loam topsoil; Subsoil texture: sodic clay.
Water availability	Very low to low (30–80 mm).
Rooting depth	20–60 cm.
Fertility	Very low total nitrogen, very low phosphorous, low potash.

Salinity
Sodicity
pH

Long-term carrying capacity information (A condition)

Low to moderate.
Moderate to high.
Acid to alkaline.

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 1156 – 1690 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	2470 - 3320	15%	5.9 – 7.9
	10 TBA 25 FPC	1140 - 1920	15%	10 – 17
Sown			30%	

Enterprise

Breeding and growing; finishing only possible with high fertiliser inputs.

Land use and management recommendations

- Tea tree sucker regrowth can be a serious problem.
- When developing new country, or clearing of regrowth country, it is recommended to leave clumps or strips of original vegetation, and blade plough or use Grasslan (chemical) pellet, to prevent tea tree regrowth on areas to be pastured.
- In some areas, deep ploughing may bring sodic clay to the surface which could hinder grass growth. If ripping is chosen, only rip to 30–40 cm depth, bumper and immediately spread pasture seed to stabilise the area.
- Tully and pangola grass recommended for low areas subject to flooding.

Land use limitations

- High input costs for sown pastures.
- Tea tree regrowth problems. In some areas the soils overlie sandstone.
- These soils are poorly drained with summer flooding often resulting in these areas turning 'mushy' with water logging affecting pasture and causing problems for animal and vehicle movement.
- There is a risk of soil compaction and 'debil debil' formation necessitates more frequent renovation (tillage).
- This country is very erodible despite the lack of elevation and slope.

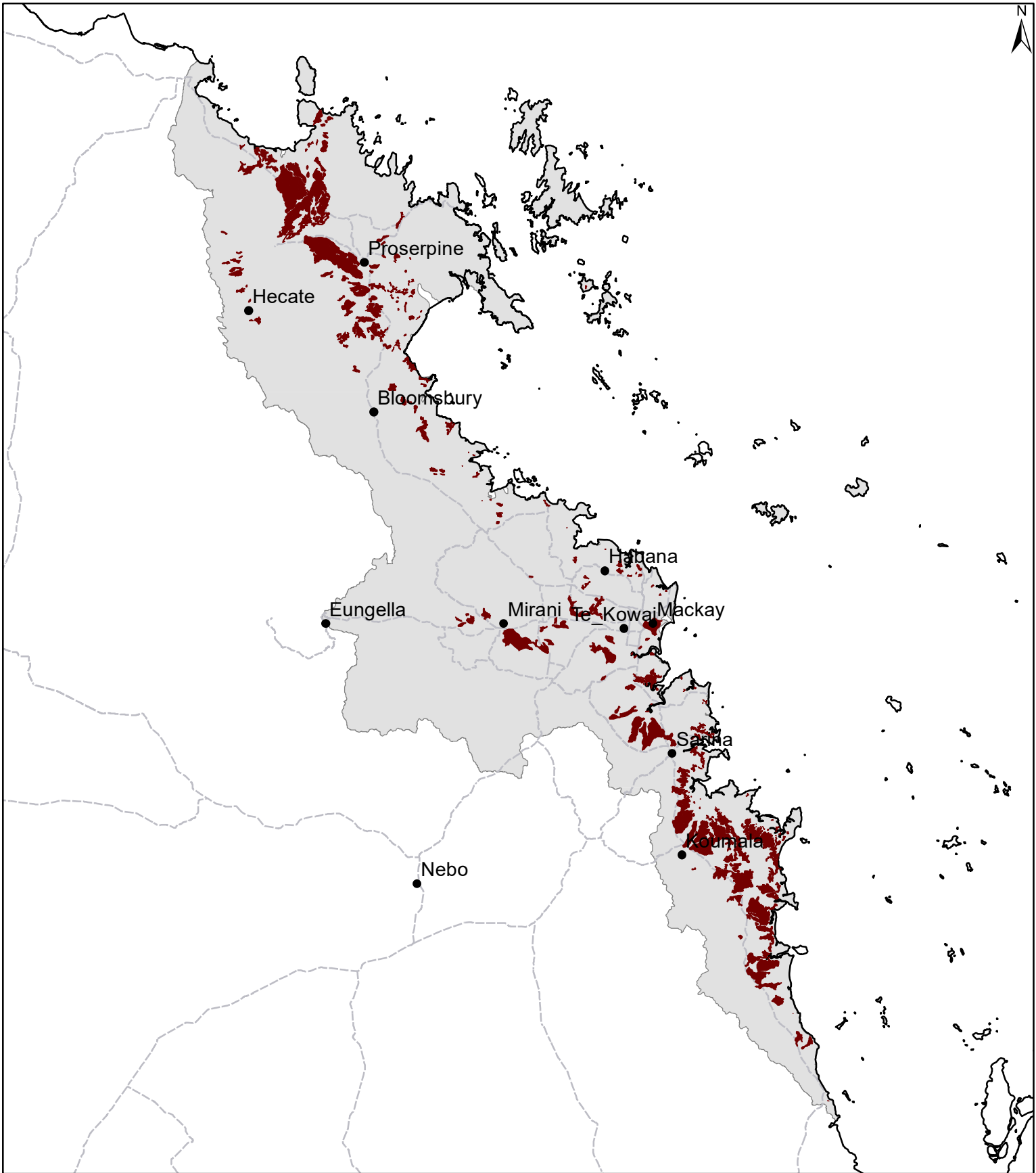
Conservation features and related management

- This land type has a conservation status 'Of Concern' and a biodiversity status of 'Endangered'.
- This vegetation type typically has a very diverse ground stratum, and many of these species remain poorly collected and known.
- It is known habitat for the threatened fauna species – grey goshawk, beach thick-knee, eastern small-eyed snake, locally rare bar-breasted honey-eater and squirrel gliders. Also habitat for the bats and other fauna such as orange-footed scrub fowl and red-tail black cockatoos.
- Conservative grazing regime to allow recruitment of canopy species.
- Protect trees with hollows (living and dead) and a ground stratum with hollow logs.
- Fencing off this area to exclude grazing during wet season will assist in controlling erosion and disturbance.

Regional Ecosystems

8.1.5, 8.3.2, 8.3.13b, 8.5.2a, 8.5.2c, 8.5.6, 8.5.7.

MW04 Coastal tea tree plains



Area of land type in region: 5%

Median rainfall (region): 631 – 1690 mm

Average rainfall (region): 736 – 1808 mm

Area of land type with FPC: 35%

Median FPC: 25%

Median TBA: 10 m²/ha



**Queensland
Government**

Coastal wetlands



Description	Frequently flooded and often waterlogged floodplains which include swamps.
Landform	Flood plains.
Woody vegetation	Mixed melaleuca/tea tree woodlands with occasional blue gum, Leichhardt tree, pandanus and cabbage palms.
Expected pasture composition	<i>Originally blady grass and sparse or absent native pasture communities. Considerable areas of para grass, hymenachne and Aleman have naturalised from past plantings.</i> <i>* Denotes non-native "Expected Pasture Composition" species.</i>
Preferred	Water couch, marine couch, salt water couch*.
Intermediate	
Non-preferred	Reedgrass, sourgrass*.
Annual grasses	Barnyard grasses.
Common forbs	Sedge. Non-preferred species include bulrushes, reeds.
Suitable sown pastures	Pangola grass, Tully grass, joint-vetch.
Introduced weeds	Introduced weedy <i>Sporobolus</i> grasses. Environmental weeds hymenachne, para, Aleman grasses. Hymenachne is a restricted invasive plant under the <i>Biosecurity Act 2014</i> . It must not be given away, sold, or released into the environment without a permit.
Soil	Deep, gradational clay soil. The main soil types include vertosols, dermosols and hydrosols.
Description	Surface: Firm and may crack; Surface texture: sandy clay loam to medium clay; Subsoil texture: clay loam to heavy clay.
Water availability	Moderate to high (70–80 mm).
Rooting depth	>1 m (depending on depth to water table).

Fertility	Moderate to high.
Salinity	Low to moderate.
Sodicity	Low to moderate.
pH	Strongly acid to 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 1156 – 1690 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	4300 - 5510	50% (sown)	1.1 – 1.4
	24 TBA 55 FPC	< 1460 - 2460	50% (sown)	> 2.4 – 4.0

Enterprise

Finishing

Land use and management recommendations

- Fence where possible to protect sensitive areas.

Land use limitations

- Flooding
- Acid sulphate soils can be present and, because of this soil hazard, professional advice should be sought before excavating in these wetland areas.

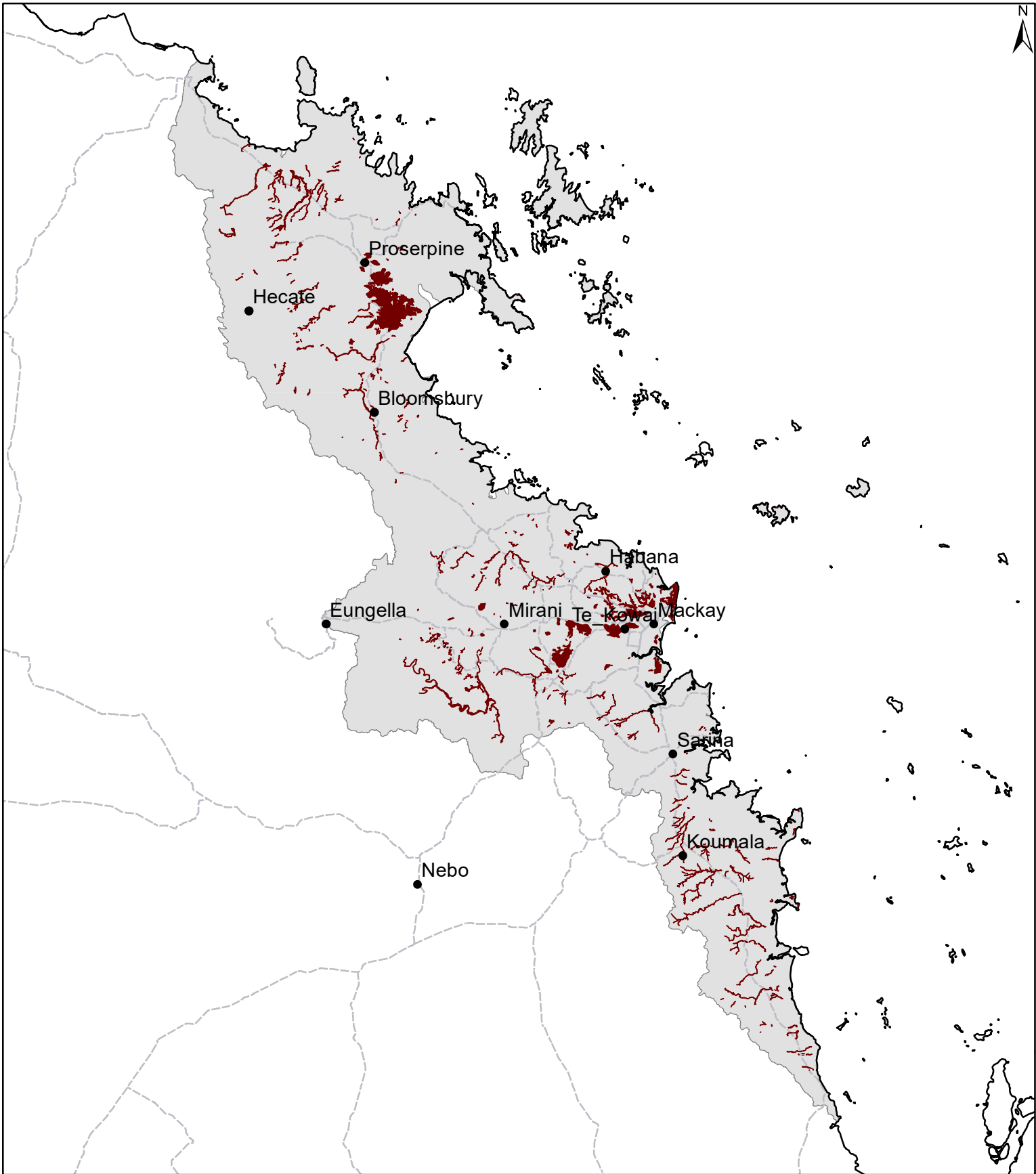
Conservation features and related management

- These areas provide habitats for migratory bird which are protected by international treaties.
- Important fisheries habitats may be present and should be kept free of declared and environmental weeds.
- This vegetation type typically has a very diverse ground stratum, and many of these species remain poorly collected and known. Intact (non-weedy) examples of this vegetation type are now very rare. It is known habitat for threatened plant species, e.g. black ironbox (*Eucalyptus raveretiana*).
- Some important fauna are found in this land type including rufous owl, grey goshawk, eastern small-eyed snake, azure kingfisher and the locally rare bar-breasted honey-eater.
- Larger melaleucas are likely to contain important hollows and provide seasonal food sources for birds, flying foxes and gliders. Important habitat for the greater glider particularly in drier areas. Also habitat for the red-bellied black snake and important habitat for a large variety of waterbirds, barramundi and other fauna such as the green pygmy goose and water python.
- Fencing off this area to exclude grazing permanently or exclude during wet season to assist erosion control and reduce disturbance.

Regional Ecosystems

8.2.7a, 8.2.9, 8.3.3a, 8.3.4, 8.3.11, 8.3.12, 11.3.27x1c.

MW05 Coastal wetlands



Area of land type in region: 2%
Median rainfall (region): 631 – 1690 mm
Average rainfall (region): 736 – 1808 mm
Area of land type with FPC: 37%
Median FPC: 55%
Median TBA: 24 m²/ha



**Queensland
Government**

Eucalypt hills and ranges



Description	Moderate to steep slopes with eucalypt woodlands and forests on moderately fertile soils. Occur at an altitude higher than 700 m.
Landform	Higher hills and ranges.
Woody vegetation	Pink bloodwood, grey ironbark, Moreton Bay ash, and scattered poplar gum.
Expected pasture composition	<i>Originally black speargrass native pasture community.</i> * Denotes non-native "Expected Pasture Composition" species.
Preferred	Black speargrass, forest bluegrass, kangaroo grass.
Intermediate	Pitted bluegrass, golden beard grass.
Non-preferred	Some blady grass, purpletop chloris*.
Annual grasses	Summer grass.
Suitable sown pastures	Green panic, creeping bluegrass, Indian bluegrass on soils with sufficient depth. Stylo, joint-vetch, round-leaf Wynn cassia can be surface sown into less accessible and steeper areas of native pasture but can dominate native pastures.
Introduced weeds	Introduced weedy <i>Sporobolus</i> grasses (including giant rat's tail), lantana, snakeweed and other broad leaf weeds.
Soil	Shallow to moderately deep soil. The soil types are mostly brown chromosols.
Description	Surface: Firm to hard-setting; Surface texture: sandy loam to sandy clay loam; Subsoil texture: clay.
Water availability	Low to moderate (60–90 mm).
Rooting depth	20–50 cm

Fertility	Low
Salinity	May have down slope salinity issues.
Sodicity	Non-sodic to mildly sodic.
pH	Acid trend.

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 1156 – 1690 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	4470 - 5350	30%	1.8 – 2.2
	29 TBA 64 FPC	< 890 - 2490	30%	> 3.9 – 11
Sown			35%	

Enterprise

Breeding

Land use and management recommendations

- Limited sown pasture development possible.
- Woody regrowth control could be required in cleared areas.
- Where stylo and Wynn cassia legumes sown, careful grazing management is required to prevent native grasses being grazed out and resulting in legume dominance.
- Clearing not recommended on slopes >20%.

Land use limitations

- Shallow soils, low soil phosphorous.
- Steep topography.
- Soils are moderately well drained but are erodible.

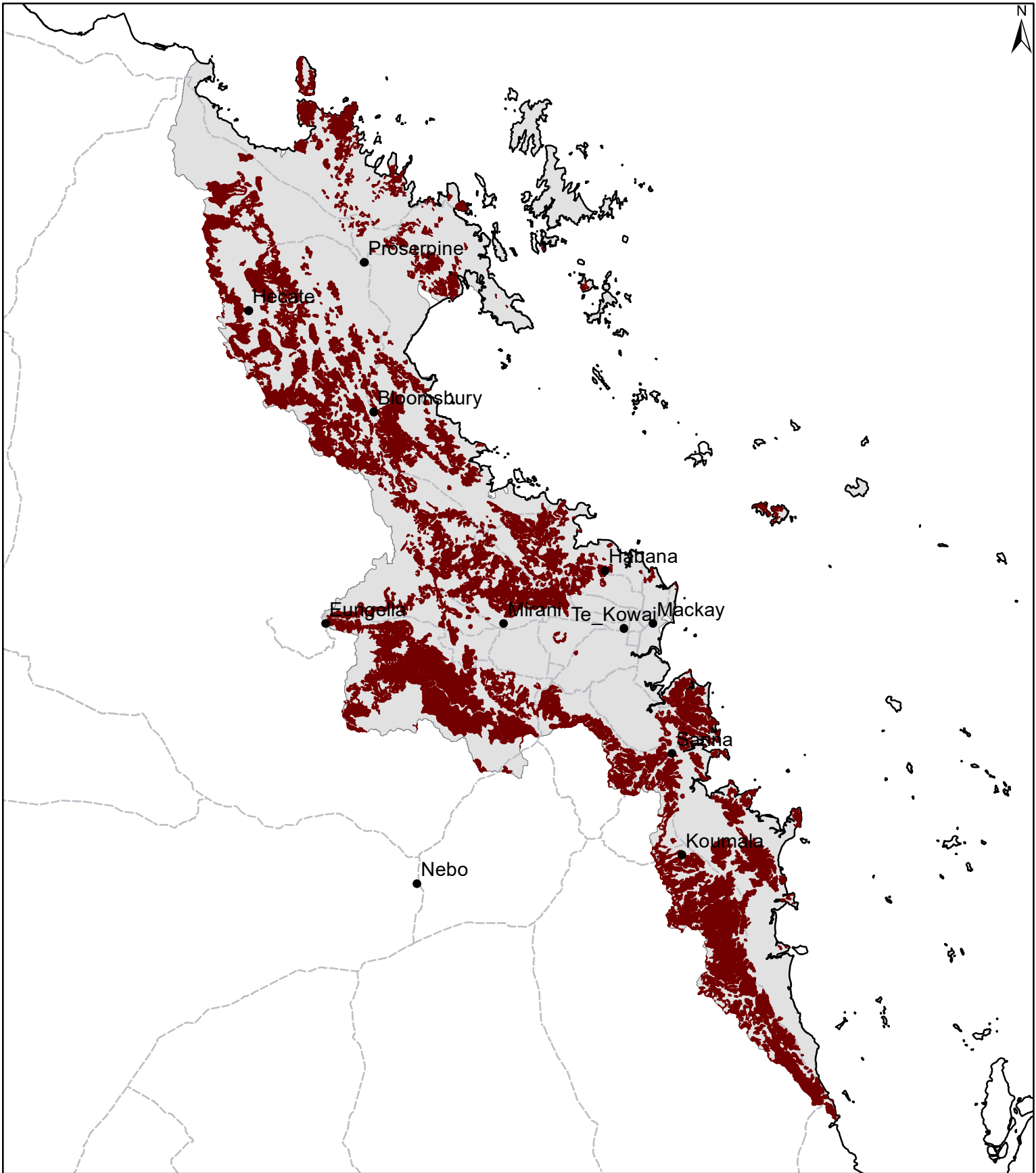
Conservation features and related management

- Habitat for the threatened fauna species - northern quoll, glossy black-cockatoo and squirrel glider.
- Conservative grazing regime to allow recruitment of canopy species.
- Appropriate fire regime to maintain eucalypt community.
- Protect trees with hollows (living and dead) and a ground stratum with hollow logs.
- If thinning of community, limit thinning to maintain a maximum distance of 30 m between trees.

Regional Ecosystems

7.11.14a-b, 7.11.19a-c, 7.11.26f, 7.11.31b-e, 7.11.33b, 7.11.35a-d, 7.11.44, 7.11.50a, 7.12.21a-d, 7.12.22a-e, 7.12.23a-e, 7.12.24a-c, 7.12.25a, 7.12.25c, 7.12.26a-f, 7.12.27b-c, 7.12.28a-b, 7.12.29b-c, 7.12.29d-f, 7.12.30a, 7.12.30c-d, 7.12.35, 7.12.37a-d, 7.12.37h-i, 7.12.54g, 7.12.57a, 7.12.57c, 7.12.58, 7.12.59, 7.12.5a-f, 7.12.61a, 7.12.65a-c, 7.12.65e, 7.12.65k, 7.12.66a-e, 8.11.12, 7.12.8.11.3a, 8.2.12a, 8.3.8, 8.9.1, 8.11.5a-b, 8.12.4, 8.12.5a, 8.12.5c, 8.12.6a-b, 8.12.9, 8.12.12a, 8.12.12d, 8.12.22, 8.12.23, 8.12.27b, 8.12.31a, 8.12.32, 9.12.2.

MW06 Eucalypt hills and ranges

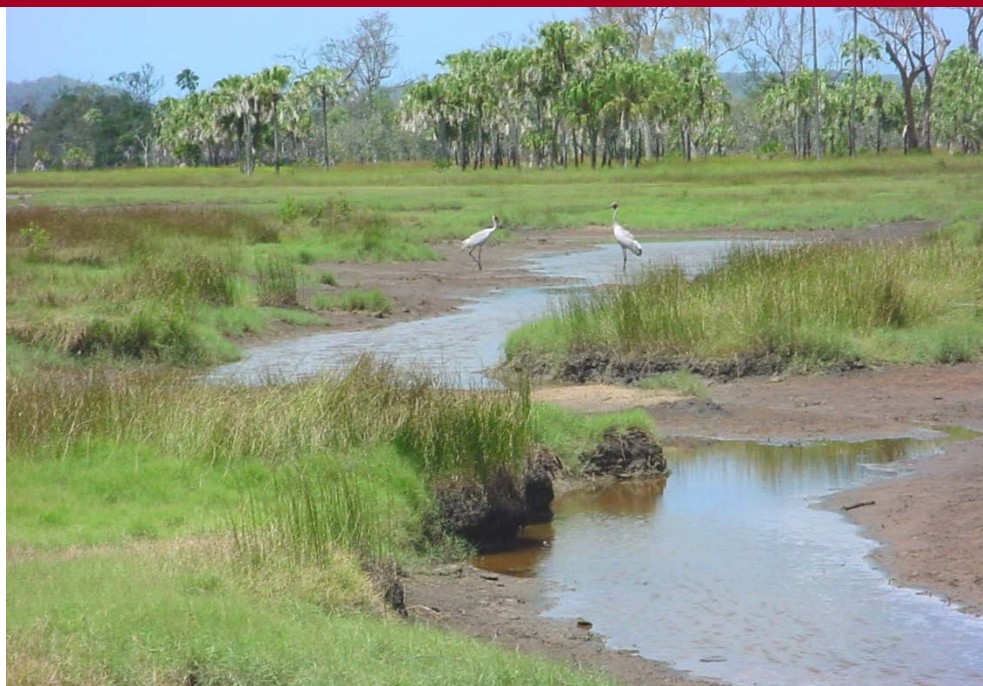


Area of land type in region: 29%
Median rainfall (region): 631 – 1690 mm
Average rainfall (region): 736 – 1808 mm
Area of land type with FPC: 73%
Median FPC: 64%
Median TBA: 29 m²/ha



**Queensland
Government**

Marine plains and tidal flats



Description	Flat land in, and adjacent to, mangrove and salt couch areas.
Landform	Marine plains and tidal flats.
Woody vegetation	Mangrove associations, melaleuca/tea tree.
Expected pasture composition	<i>Originally sparse or absent native pasture community.</i> * Denotes non-native "Expected Pasture Composition" species.
Preferred	Salt water couch*, marine couch, water couch.
Intermediate	
Non-preferred	
Common forbs	Samphire (preferred), fringe rush (intermediate), sedges (non-preferred).
Suitable sown pastures	Very limited options for sown pasture.
Introduced weeds	Para grass, hymenachne.
Soil	Very deep cracking and non-cracking clays. The dominant soil types include hydrosols, vertosols and sodosols.
Description	Surface: Firm; Surface texture: Light to medium clay; Subsoil texture: Medium to heavy clay.
Rooting depth	Moderate (45 cm) for adapted plants.
Fertility	Moderate to high total nitrogen, moderate to high phosphorous.
Salinity	Moderate to very high.
Sodicity	Moderate to very high.

pH

Very strongly acid to 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 1346 – 1690 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	3050 - 3370	30%	2.9 - 3.2
	20 TBA 47 FPC	480 - 1080	30%	9.0 – 20

Enterprise

Growing

Land use and management recommendations

- Opportunistic grazing in association with less sensitive land types.

Land use limitations

- There may be limitations to grazing on grazing leases below high tide mark.
- These soils are poorly drained and have water logged subsoils.
- Low infiltration rates except when very dry.
- Frequently flooded.
- Acid sulphate soils underlay most of these areas. Professional advice should be sought prior to any excavation work in these areas.

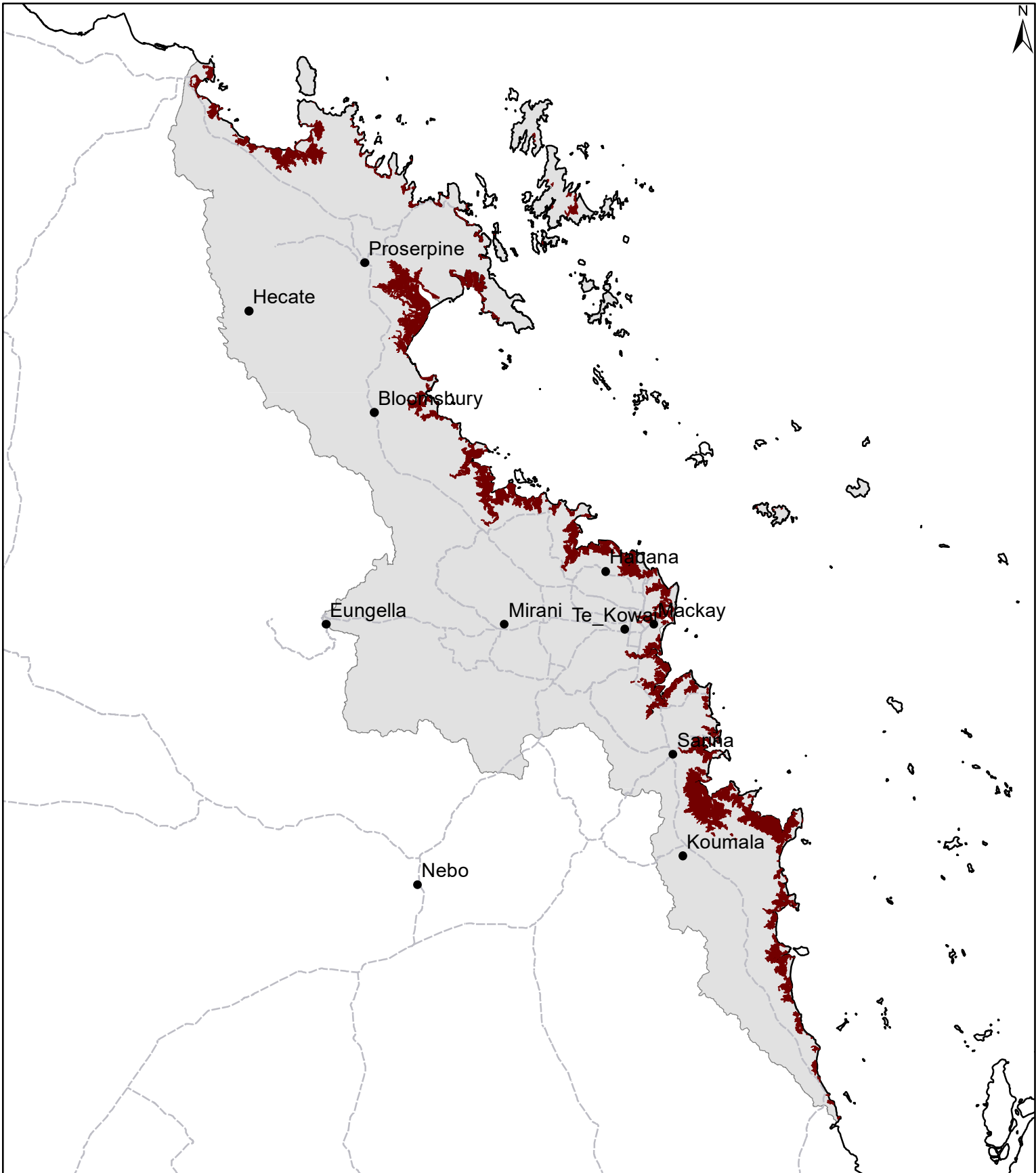
Conservation features and related management

- Mangroves are a protected plant species.
- Waterbirds are the most conspicuous component of the fauna of marine plains and tidal flats. These areas provide abundant food in the dense cover, and in the more open areas, for most of the major waterbird groups.
- A key strategy for grazing management is for fencing that enables wetlands to be excluded from grazing at strategic times, particularly when their edges are soft and liable to deep plugging and when wetland plants have not yet completed the seeding stage.
- Where exotic pasture grasses, such as para grass and hymenachne have become established, an appropriate level of grazing pressure on these grasses will be necessary to ensure they do not spread and overrun the area to the exclusion of native plants.

Regional Ecosystems

8.1.1, 8.1.2, 8.1.3, 8.1.4.

MW07 Marine plains and tidal flats



Area of land type in region: 5%
Median rainfall (region): 631 – 1690 mm
Average rainfall (region): 736 – 1808 mm
Area of land type with FPC: 69%
Median FPC: 47%
Median TBA: 20 m²/ha



**Queensland
Government**

Poplar gum woodlands



Description	Flat to slightly undulating country which experiences occasional (one in every 10–50 years) flooding and supports eucalypt woodlands dominated by poplar gums.
Landform	Terrace plains and backplains to low undulating hills.
Woody vegetation	Poplar gum woodlands associated with swamp mahogany, pink bloodwood, Moreton Bay ash.
Expected pasture composition	<i>Originally black speargrass and blady grass native pasture communities. Much of this land type has been developed to cane and sown pastures.</i> <i>* Denotes non-native “Expected Pasture Composition” species.</i>
Preferred	Black speargrass, forest bluegrass, kangaroo grass.
Intermediate	Pitted bluegrass, golden beard grass.
Non-preferred	Blady grass, purpletop chloris*.
Annual grasses	Summer grass.
Common forbs	Low level of native legumes present (<i>Desmodium</i> , <i>Glycine</i> , <i>Vigna</i> , <i>Alysicarpus</i>).
Suitable sown pastures	Rhodes grass, green panic, signal grass, Tully grass, creeping blue grass, Angleton grass. Stylo, joint-vetch.
Introduced weeds	Introduced weedy <i>Sporobolus</i> grasses (including giant rat's tail), lantana. General broad leaf weeds including devil's fig, sida and flannel weed, urena/pink burr, Noogoora burr, snakeweed, grader and thatch grass.
Soil	Deep soil. The soil types are mostly sodosols and chromosols.
Description	Surface: Hard-setting; Surface texture: sandy to loam; Subsoil texture: grey to brown clay.
Water availability	Low to moderate (60–90 mm).

Rooting depth	30–60 cm
Fertility	Low to moderate.
Salinity	Low to moderate.
Sodicity	Non sodic to mildly sodic.
pH	Subsoil is acid to 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 1156– 1614 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	3790 - 4400	30%	2.2 – 2.6
	12 TBA 30 FPC	1130 - 2140	30%	4.6 – 8.6
Sown			35%	

Enterprise

Breeding and growing, with fattening possible in limited areas with high fertiliser inputs.

Land use and management recommendations

- Moderate to high fertiliser inputs to maintain high productive sown pastures.
- Woody regrowth control could be required in areas cleared for pasture.
- Where stylo is over sown into native pasture use grazing management (spelling) or fire to avoid legume dominance.

Land use limitations

- Low soil phosphorous.
- Soils are moderate to poor drainage.

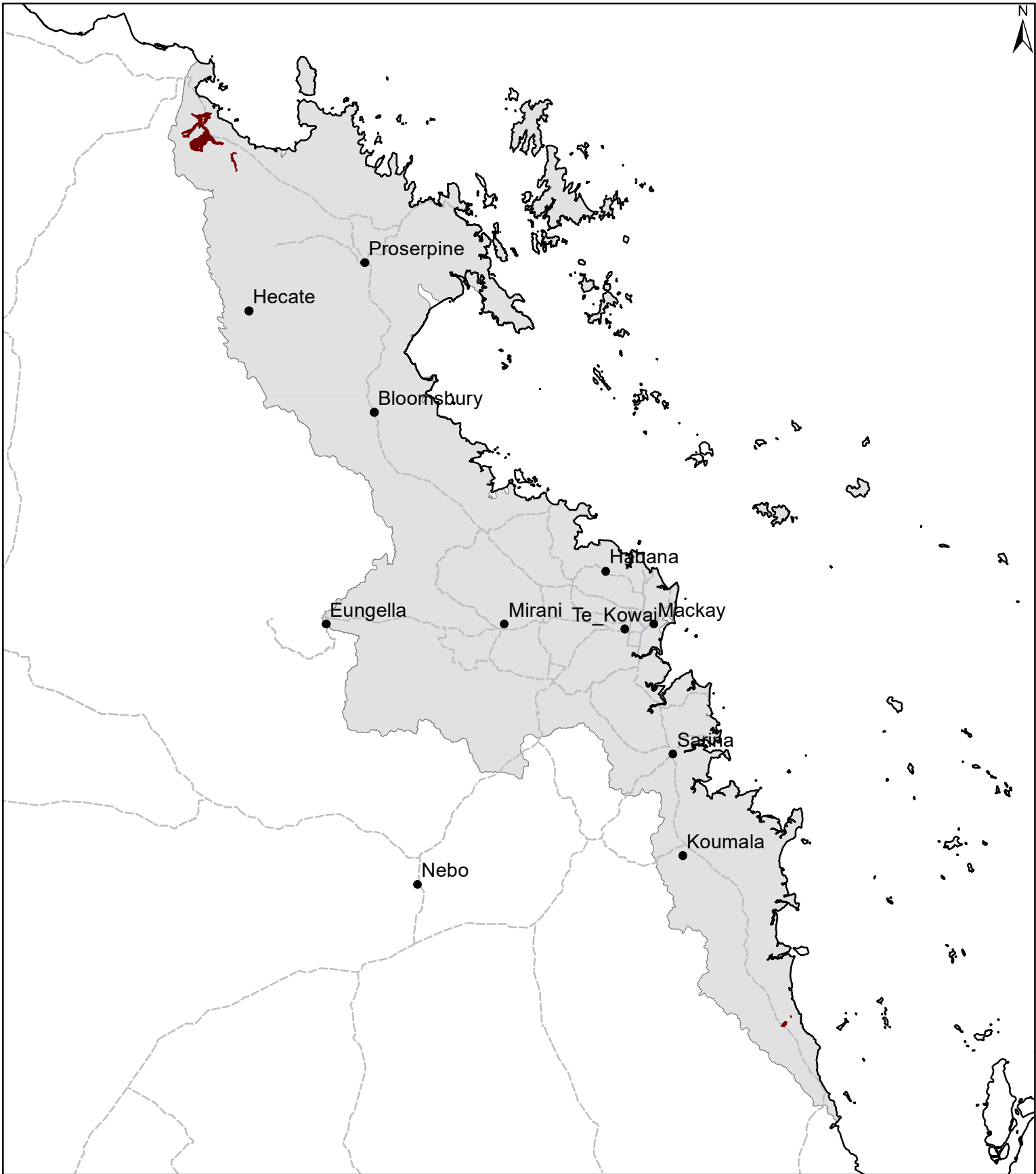
Conservation features and related management

- Conservation rating “Of Concern” and a biodiversity rating “Endangered”.
- A diverse vegetation unit which has been poorly surveyed for flora and fauna.
- Significant fauna species include the black-chinned honeyeater, koala and squirrel glider.
- Conservative grazing regime to allow recruitment of canopy species.
- Appropriate fire regime to maintain eucalypt community.
- Protect trees with hollows (living and dead) and a ground stratum with hollow logs.
- If thinning of community, limit thinning to maintain a maximum distance of 30 m between trees.

Regional Ecosystems

7.3.16a-c, 7.11.20.

MW08 Poplar gum woodlands



Area of land type in region: 0.2%

Median rainfall (region): 631 – 1690 mm

Average rainfall (region): 736 – 1808 mm

Area of land type with FPC: 75%

Median FPC: 30%

Median TBA: 12 m²/ha



**Queensland
Government**

Wet highland rainforests



Description	Rainforest on steeper areas of Clarke range with an elevation more than 700 m.
Landform	High hills and steep slopes.
Woody vegetation	Rainforest vegetation including red, white and Mackay cedars, hoop pine, red Eungella satinash, scrub cherry, black tulip oak, quandong. On the fringes flooded or rose gums occur.
Expected pasture composition	<i>Originally sparse or absent native pasture community, considerable areas developed for dairy farms post 1940s.</i> <i>* Denotes non-native "Expected Pasture Composition" species.</i>
Preferred	
Intermediate	
Non-preferred	Narrow-leaf mat grass* has naturalised following fertility rundown post clearing.
Suitable sown pastures	Rhodes grass, setaria grasses, kikuyu grass, clovers, creeping vigna (legume).
Introduced weeds	Introduced weedy <i>Sporobolus</i> grasses (e.g. giant rat's tail), lantana. Susceptible to general broad leaf and grass weeds depending on pasture and grazing management.
Soil	Moderately deep to deep, gradational soil with clay loam topsoil over reddish brown subsoil. The main soil type is dermosols.
Description	Surface: Hard-setting to firm; Surface texture: dark loam to clay; Subsoil texture: red clay.
Water availability	Moderate to high.
Rooting depth	0.5–1 m.

Fertility	Quick rundown once rainforest cleared.
Salinity	Low
Sodicity	Low
pH	Acid trend.

Long-term carrying capacity information (A condition)

Based on fully watered area for 1AE = 450 kg animal consuming 8kg DM/day				
Median annual rainfall 1614 – 1679 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	8010 - 8680	50% (sown)	0.7
	42 TBA 83 FPC	< 3320 - 4220	50% (sown)	> 1.4 – 1.8

Enterprise

Initially developed for dairy farms. Currently breeding and finishing with fertiliser inputs.

Land use and management recommendations

- High input of fertiliser to maintain sown pastures.
- Need to be vigilant with lantana control.
- Suitable for pasture improvement (depending on topography).
- Retain trees on bed and bank of streams.
- Selective logging of timber trees could be possible, if undertaken in accordance with State Forestry and vegetation management policies and guidelines.
- Maintain good pasture cover to avoid erosion during high rainfall periods.
- Use off stream watering points for cattle grazing where possible.

Land use limitations

- Steep slopes (<15–20%) can limit pasture development.
- Tree vegetation status should be checked before development.
- Pasture rundown is relatively quick after clearing (5 years).

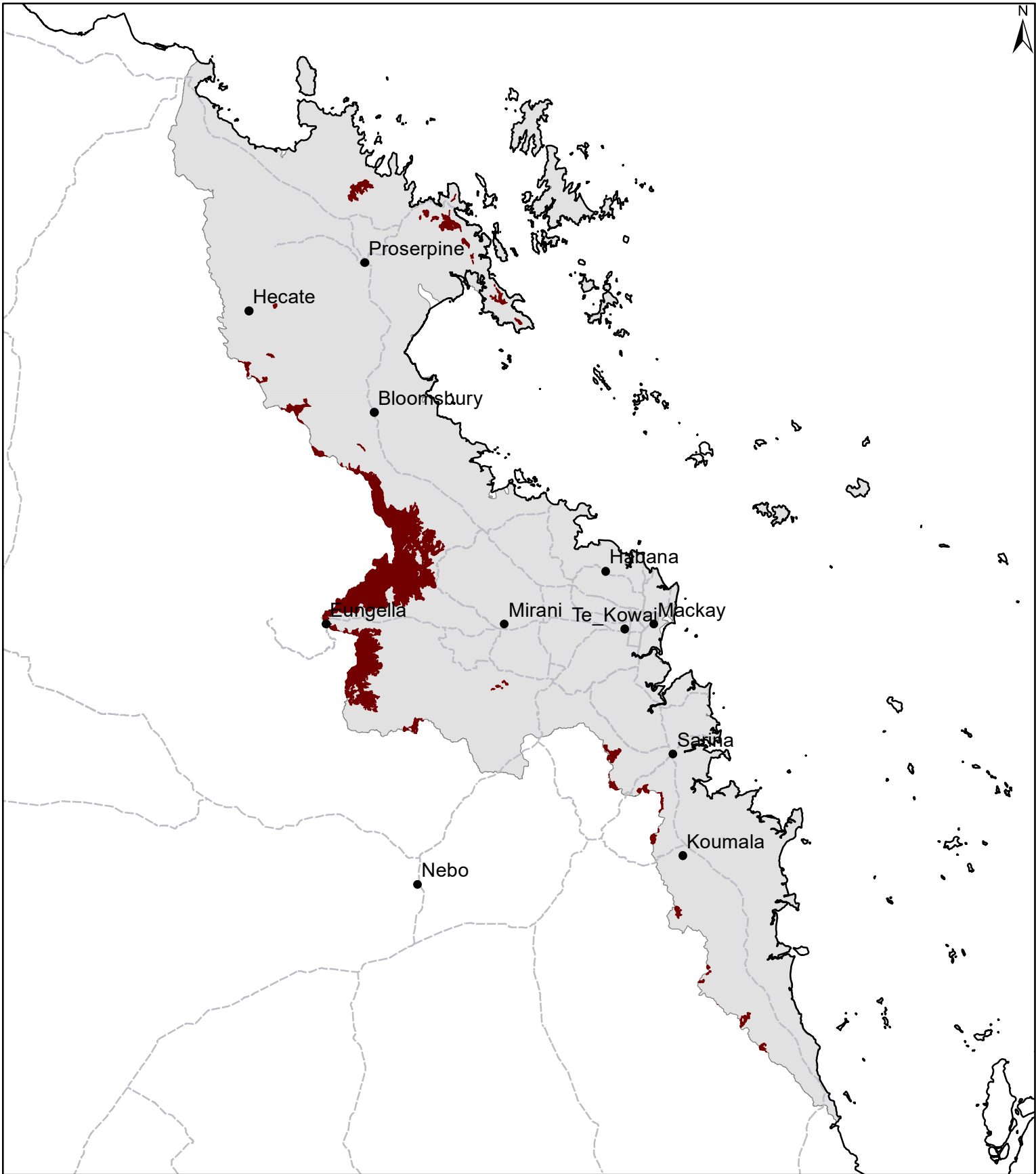
Conservation features and related management

- Very high conservation values where existing rainforest vegetation remains.
- Habitat for threatened fauna species including rufous owl, Eungella honeyeater, Proserpine rock wallaby, Eungella day frog and Eungella tinker frog, skink and endemic leaf-tail geckos. The light colour form of the southern boobook owl is of locally significant conservation value. Also habitat for the red-bellied black snake and eastern small-eyed snake.
- Isolation of remnants over time has resulted in speciation within distinct rainforest types.
- Grazing exclusion area. Protect community edges from fire encroachment.

Regional Ecosystems

7.11.12a-b, 7.11.12f, 7.11.1a-b, 7.11.1f, 7.11.29a, 7.11.30, 7.11.7d, 7.12.16a-b, 7.12.17, 7.12.1b, 7.12.64a-e, 7.12.68, 7.12.7a-b, 7.12.9, 7.8.13, 7.8.14, 7.8.2a-c, 7.8.3a, 7.8.4a-d, 8.8.1a, 8.12.1a-b, 8.12.2, 8.12.3b, 8.12.17a, 8.12.17c, 8.12.30.

MW09 Wet highland rainforests



Area of land type in region: 7%
Median rainfall (region): 631 – 1690 mm
Average rainfall (region): 736 – 1808 mm
Area of land type with FPC: 53%
Median FPC: 83%
Median TBA: 42 m²/ha



**Queensland
Government**