Descriptions for NSW (Mitchell) Landscapes

Version 2 (2002)

Based on descriptions compiled by Dr. Peter Mitchell.

Department of **Environment & Climate Change** NSW

Visit us on the web:
www.environment.nsw.gov.au

Disclaimer

The descriptions in this document apply to the NSW (Mitchell) Landscapes version 2, compiled in 2002 by Dr. Peter Mitchell under contract to the (then) NSW National Parks and Wildlife Service.

Since the original mapping of NSW Landscapes in 2002, several more fine scale data layers have been made available, including SPOT 5 satellite imagery, NSW wetlands, contours and improved drainage layers. The availability of these finer scale data layers highlighted spatial inconsistencies in the NSW Landscapes data layer, identifying areas where shifts in data have occurred, or where the original digitising did not capture the intricacies of the underlying environment. In response, in 2008 the Department of Conservation and Climate Change (DECC) undertook a review of the bounds of the NSW Landscapes.

The analysis undertaken originally identified a range of errors and inaccuracies with the bounds of the NSW Landscapes data layer, predominantly in the eastern half of the State, including:

- shifts in the Landscape polygons;
- problematic outliers in the Landscape layers;
- overlaps and gaps along Landscape boundaries;
- inconsistencies in the delineation of some Landscapes.

Correction of these errors was undertaken by Eco Logical Australia under contract to DECC. Correction of the NSW Landscapes layer was confined to fixing boundary errors, and no attempt has been made to redefine the landscape classes, or their descriptions. The review has resulted in a new version - version 3 - of the NSW landscapes layer being compiled and made available. While the great majority of landscape descriptions have not been affected, a small number of the landscape descriptions may no longer be entirely accurate if interpreted against the spatial data provided for version 3.

Details of the original and update methodologies are available in the following documents:

Mitchell, P.B. (unpub). NSW ecosystems study: background and methodology. Unpublished report to the NSW National Parks and Wildlife Service, Hurstville.

Eco Logical Australia, (2008). Editing Mitchell Landscapes, Final Report. A Report prepared for the Department of Environment and Climate Change.

Table Of Contents

Descriptions of Mitchell Landscapes

AA - Descriptions for Landscapes in the Australian Alps Bioregion

Meso: AA Alpine

Azo Alpine Zone AA Alpine
High plateau and block faulted ranges on Silurian-Devonian gneissic granite and granites, with a linear unit of Ordovician greywacke, phyllite and schist above the tree line at 1800m. Mountain peaks, scree slopes and tor covered rounded hills stand above the plateau, local relief 450m. Relic Pleistocene cirque glacier landforms and glacial lakes, block streams and periglacial solifluction lobes. Wet, uniform textured alpine humus soils and peat with abundant organic matter, steep slopes have stonier, shallow profiles.

Tussock grasslands, alpine herb field, rare feldmark, snow patch communities, valley and raised bogs, all with high endemism. Common species include; prickly snow grass (*Poa costiniana*), alpine wallaby grass (*Danthonia nudiflora*), ribbony grass (*Chionochloa frigida*), silver snow daisy (*Celmisia asteliifolia*), alpine sunray (*Leuchrysum albicans*), mountain celery *(Aciphylla glacialis)*, mountain plum pine (*Podocarpus lawrencei*), mountain gentian (*Gentianella diemensis*), white purslane (*Neopaxia australasica*), coral heath (*Epacris gunnii*), carpet heath (*Pentachondra pumila*), eye-bright (*Euphrasia collina*), sky lily (*Herpolirion novae-zelandiae*), alpine rice-flower (*Pimelea alpina*), yellow kunzea (*Kunzea muelleri*), silver ewartia (*Ewartia nubigena*), felted buttercup (*Ranunculus muelleri*), anemone buttercup (*Ranunculus anemoneus*), sphagnum (*Sphagnum cristatum*), alpine bog-rush (*Schoenus calyptratus*), and sedges (*Carex* spp).

Bos Bogong Sub-alpine AA Alpine
Peaks above the Bogong montane plateau and ridges on Devonian gneiss and massive granite, granodiorite and diorite below the tree line with general elevation from 1300 to 1600m. Tor covered rounded hills, rocky slopes and valley swamps developed in the dendritic drainage network, local relief 300m. Uniform textured alpine humus and transitional alpine humus soils and peat with abundant organic matter, steep slopes have stonier profiles over deeply weathered bedrock. The boundary with montane communities is found at different levels on different aspects.

Open to dense sub-alpine woodlands of snow gum (*Eucalyptus pauciflora*) with patchy open grasslands, fen, heath and bogs in the valleys controlled by cold air drainage and soil moisture. Black sallee (*Eucalyptus stellulata*) marginal to streams. Typical shrubs and ground cover species include; snow grasses (*Poa* spp.), wallaby grasses (*Austrodanthonia* and *Danthonia* spp.), silver snow daisy (*Celmisia asteliifolia*), alpine orites (*Orites lancifolia*), alpine hovea (*Hovea montana*), mountain shaggy-pea (*Oxylobium alpestre*), alpine rice-flower (*Pimelea alpina*), speedwell (*Veronica serpyllifolia*), scaly everlasting (*Ozothamnus hookeri*), Tasman flax-lily (*Dianella tasmanica*), mountain gentian (*Gentianella diemensis)*, variable groundsel (*Senecio lautus*), and native dandelion (*Microseris lanceolata*).

Cbs Cabramurra - Kiandra Basalt Caps and Sands AA Alpine
Extensively distributed Tertiary basalt flow remnants capping hills on the high plains. Fluvial quartz gravels, sands and silts of former river channels are exposed beneath the basalt. Soil materials and sediments from the basalt and quartz sands extend down slope over Ordovician

meta-sediments or Silurian-Devonian granites toward the alpine valleys. Most basalt outcrops are columnar jointed and formed periglacial block streams during the Pleistocene. General elevation 1400 to 1650, local relief to 200m. Uniform and gradational, organic rich, brown clay loams, often stony. This ecosystem extends to lower elevations in the South Eastern Highlands biogeographical region where soils are deeper and redder, and the vegetation reflects adjacent communities.

Open sub-alpine woodlands of snow gum (*Eucalyptus pauciflora*) on the hills with extensive open grasslands, heath and bogs in the valleys. Black sallee (*Eucalyptus stellulata*) along streamlines on the valley floors. Associated shrubs and ground cover include; leafy bossiae (*Bossiaea foliosa*), alpine oxylobium (*Oxylobium alpestre*), alpine daisy bush (*Olearia algida*), candle heath (*Richea continentis*), alpine baeckea (*Baeckea gunniana*), long-leaf hovea (*Hovea longifolia*), alpine phebalium (*Leionema phylicicfolium*), alpine orites (*Orites lancifolia*), alpine hovea (*Hovea montana)*, mountain shaggy-pea (*Oxylobium alpestre)*, snow grasses (*Poa* spp.), sedges (*Carex* spp.) and sphagnum (*Sphagnum cristatum*).

Chs Chimneys Ridge Sub-alpine AA Alpine

High plateau and block faulted ranges on Silurian-Devonian gneissic granite and granites, and areas of Devonian rhyolite below the tree line with general elevation from 1500 to 1800m. Peaks and tor covered rounded hills stand above the plateau, valley swamps developed in the dendritic drainage network, local relief 300m. Limited areas of Pleistocene block streams and slope deposits. Uniform textured alpine humus and transitional alpine humus soils and peat with abundant organic matter, steep slopes have stonier profiles over deeply weathered bedrock.

Open to dense sub-alpine woodlands of snow gum (*Eucalyptus pauciflora*) with open grasslands, fen, heath and bogs in the valleys controlled by cold air drainage and soil moisture. Black sallee (*Eucalyptus stellulata*) marginal to streams. Typical shrubs and ground cover species include; snow grasses (*Poa* spp.), wallaby grasses (*Austrodanthonia* and *Danthonia* spp.), silver snow daisy (*Celmisia asteliifolia*), alpine orites (*Orites lancifolia)*, alpine hovea (*Hovea montana)*, mountain shaggy-pea (*Oxylobium alpestre*), alpine rice-flower (*Pimelea alpina*), speedwell (*Veronica serpyllifolia*), scaly everlasting (*Ozothamnus hookeri*), Tasman flax-lily (*Dianella tasmanica*), mountain gentian (*Gentianella diemensis)*, variable groundsel (*Senecio lautus*), and native dandelion (*Microseris lanceolata*).

Jag Jagungal Tops AA Alpine

High plateau and block faulted ranges on Silurian-Devonian gneissic granite and granodiorite, areas of Ordovician slates, chert, and phyllite below the tree line with general elevation from 1500 to 1800m. Peaks and tor covered rounded hills stand above the plateau, extensive valley swamps developed in the dendritic drainage network, local relief 300m. Limited areas of Pleistocene block streams and slope deposits. Uniform textured alpine humus and transitional alpine humus soils and peat with abundant organic matter, steep slopes have stonier profiles over deeply weathered bedrock.

Open to dense sub-alpine woodlands of snow gum (*Eucalyptus pauciflora*) with open grasslands, fen, heath and bogs in the valleys controlled by cold air drainage and soil moisture. Black sallee (*Eucalyptus stellulata*) marginal to streams. Typical shrubs and ground cover species include; snow grasses (*Poa* spp.), wallaby grasses (*Austrodanthinia* and *Danthonia* spp.), silver snow daisy (*Celmisia astelifolia*), alpine orites (*Orites lancifolia)*, alpine hovea (*Hovea montana)*, mountain shaggy-pea (*Oxylobium alpestre*), alpine rice-flower (*Pimelea alpina*), speedwell (*Veronica erpyllifolia*), scaly everlasting (*Ozothamnus hookeri*), Tasman flax-lily (*Dianella tasmanica*), mountain gentian (*Gentianella diemensis)*, variable groundsel (*Senecio lautus*), and native dandelion (*Microseris lanceolata*).

Kxs Kings Cross Sub-alpine AA Alpine

High plains environment on Ordovician sandstone, slate, quartzite and chert with limited areas of Silurian-Devonian granites below the tree line with general elevation from 1500 to 1800m. Low rocky hills and tor covered rounded hills stand above the plain, valley swamps developed in the dendritic drainage network, local relief 300m. Limited Pleistocene solifluction slope deposits. Uniform textured alpine humus and transitional alpine humus soils and peat with abundant organic matter, shallow stony profiles on metasediments and deeper profiles on granites over deeply weathered bedrock.

Open to dense sub-alpine woodlands of snow gum (*Eucalyptus pauciflora*) with open grasslands, fen, heath and bogs in the valleys controlled by cold air drainage and soil moisture. Black sallee (*Eucalyptus stellulata*) marginal to streams. Typical shrubs and ground cover species include; snow grasses (*Poa* spp.), wallaby grasses (*Austrodanthonia* and *Danthonia* spp.), silver snow daisy (*Celmisia astelifolia*), alpine orites (*Orites lancifolia)*, alpine hovea (*Hovea montana)*, mountain shaggy-pea (*Oxylobium alpestre)*, alpine rice-flower (*Pimelea alpina*), speedwell (*Veronica serpyllifolia*), scaly everlasting (*Ozothamnus hookeri*), Tasman flax-lily (*Dianella tasmanica*), mountain gentian (*Gentianella diemensis)*, variable groundsel (*Senecio lautus*), and native dandelion (*Microseris lanceolata*).

Mai Main Range Sub-alpine AA Alpine

High plateau and block faulted ranges on Silurian-Devonian gneissic granite and granites, with a linear unit of Ordovician greywacke, phyllite and schist below the tree line with general elevation from 1500 to 1800m. Mountain peaks and tor covered rounded hills stand above the plateau, extensive plains and valley swamps on a dendritic drainage network, local relief 300m. Limited areas of Pleistocene block streams and slope deposits. Uniform textured alpine humus and transitional alpine humus soils and peat with abundant organic matter, steep slopes have stonier profiles over deeply weathered bedrock.

Open to dense sub-alpine woodlands of snow gum (*Eucalyptus pauciflora*) with extensive open grasslands, fen, heath and bogs controlled by cold air drainage and soil moisture. Black sallee (*Eucalyptus stellulata*) marginal to streams on the high plains. Typical shrubs and ground cover species include; snow grasses (*Poa* spp.), wallaby grasses (*Austrodanthonia* and *Danthonia* spp.), silver snow daisy (*Celmisia astelifolia*), alpine orites (*Orites lancifolia)*, alpine hovea (*Hovea montana)*, mountain shaggy-pea (*Oxylobium alpestre)*, alpine rice-flower (*Pimelea alpina*), speedwell (*Veronica serpyllifolia*), scaly everlasting (*Ozothamnus hookeri*), Tasman flax-lily (*Dianella tasmanica*), mountain gentian (*Gentianella diemensis)*, variable groundsel (*Senecio lautus*), and native dandelion (*Microseris lanceolata*).

Nml Namadgi Range Alpine AA Alpine

Limited and isolated rocky peaks distributed in linear north-south chains at and above the tree line at about 1600 to 1700m on Silurian-Devonian massive granite, granodiorite and adamellite. Abundant rock outcrops and tors controlled by joint spacing, highly organic, uniform textured alpine humus soil of variable depth, local relief to 200m.

Marginal alpine communities similar to the Alpine Zone ecosystem but with fewer species, some endemism and a greater mixture of sub-alpine species from the adjacent Namadgi Range Sub-alpine ecosystem.

Nma Namadgi Range Sub-alpine AA Alpine

Steep ranges of Silurian-Devonian gneissic granite and granodiorite, with Ordovician slate, chert, quartzite, phyllite and schist. Average elevation about 1500m, ecosystem boundaries vary with aspect. Gradational sandy loams of transitional alpine humus soils merge at lower altitudes with marginal red or yellow texture-contrast soils.

Generally dense sub-alpine snow gum (*Eucalyptus pauciflora*), much of which reflects recent fire history, understorey shrubs include; alpine orites (*Orites lancifolia)*, leafy bossiae

(*Bossiaea foliosa*), yellow kunzea (*Kunzea muelleri*), alpine pepper (*Tasmannia xerophila*), mountain shaggy-pea (*Oxylobium alpestre*), small-fruit hakea (*Hakea microcarpa*)

Tth Tantangara High Plains and Peaks AA Alpine

Extensive high plains and rocky peaks Silurian greywacke, siltstone, tuff and intermediate volcanic rocks, small areas of granite below the tree line with general elevation from 1400 to 1700m. Rocky hills, slopes and wide valleys with swamps developed in the dendritic drainage network, local relief 200m. Uniform textured alpine humus and transitional alpine humus soils and peat with abundant organic matter, steep slopes have stonier profiles over deeply weathered bedrock.

Open to dense sub-alpine woodlands of snow gum (*Eucalyptus pauciflora*) with open grasslands, fen, heath and bogs in the valleys controlled by cold air drainage and soil moisture. Black sallee (*Eucalyptus stellulata*) marginal to streams. Typical shrubs and ground cover species include; snow grasses (*Poa* spp.), wallaby grasses (*Austrodanthionia* and *Danthonia* spp.), silver snow daisy (*Celmisia asteliifolia*), alpine orites (*Orites lancifolia)*, alpine hovea (*Hovea montana)*, mountain shaggy-pea (*Oxylobium alpestre)*, alpine rice-flower (*Pimelea alpina*), speedwell (*Veronica serpyllifolia*), scaly everlasting (*Ozothamnus hookeri*), Tasman flax-lily (*Dianella tasmanica*), mountain gentian (*Gentianella diemensis)*, variable groundsel (*Senecio lautus*), and native dandelion (*Microseris lanceolata*). Montane communities are included on some aspects.

Meso: AA Montane

Bom Bogong Montane AA Montane

Steep ranges and ridges on Silurian-Devonian granites and granodiorites. Rocky outcrops of rounded tors common, steep bouldery stream beds. General elevation 800 to 1700m, local relief 200 to 400m.

Gradational gritty loams grading upwards to transitional alpine humus soils. Tall forests of alpine ash (*Eucalyptus delegatensis*), brown barrel (*Eucalyptus fastigata*), and mountain gum (*Eucalyptus dalrympleana*) with diverse shrubs and grasses merge upward to snow gum (*Eucalyptus pauciflora*) communities. Drier aspects with red stringybark, (*Eucalyptus macrorhyncha*) broad-leaved peppermint (*Eucalyptus dives*), and white gum (*Eucalyptus rossii*).

Crm Chimneys Ridge Montane AA Montane

Steep slopes of the block faulted ranges on Silurian-Devonian gneissic granite and granites, and areas of Devonian rhyolite below the tree line with general elevation from 1000 to 1500m. Granites are commonly deeply weathered but large tors also occur on spurs. Gradational red and red-yellow gritty loams merging upward to uniform textured transitional alpine humus profiles.

Tall forests in moist, high rainfall environments with; alpine ash (*Eucalyptus delegatensis*), mountain gum (*Eucalyptus dalrympleana*), narrow-leaved peppermint (*Eucalyptus radiata*), manna gum (*Eucalyptus viminalis*), brown barrel (*Eucalyptus fastigata*), snow gum (*Eucalyptus pauciflora*), mountain hickory wattle (*Acacia obliquinervia*) and silver wattle (*Acacia dealbata* ssp. *subalpina*). Moist gullies with sphagnum bogs (*Sphagnum cristatum*), candle heath (*Richea continentis*) and swamp heath (*Epacris paludosa*). Alpine acacia (*Acacia alpina*) common on exposed aspects.

Dar Dargals Montane AA Montane

Steep slopes and western fall and ranges on Silurian and Silurian-Devonian massive and gneissic foliated granite with abundant large rounded rocky outcrops. General elevation 1000 to 1500m. Deep gritty slope accumulations in streamlines with Pleistocene fans on the edge of

broader valleys. Gradational gritty loams and transitional alpine humus soils. Alpine ash (*Eucalyptus delegatensis*) and mountain gum (*Eucalyptus dalrympleana*) interspersed with snow gum (*Eucalyptus pauciflora*) woodland on colder sites. Generally open but with fire history affecting tree density. Sod tussock grassland dominated by snow grass (*Poa* spp.) with scattered shrubs including; leafy bossiae (*Boassiaea foliosa*), yellow kunzea (*Kunzea muelleri*), alpine pepper (*Tasmannia xerophila*), and mountain shaggy-pea (*Oxylobium aplestre*).

Gee Geehi Gorge AA Montane

Steep sided western face of the Main Range including gorges of the Geehi and Murray Rivers. Massive Silurian-Devonian granites faulted against Silurian mudstones and sandstones and Ordovician quartzite and phyllites. Elevation range 500 to 1400m, slopes up to 25^0. Extensive gravel beds on main valley floors with some terrace development. Soils and vegetation vary considerably in an altitudinal sequence. At lower elevation soils are typically texture-contrast profiles and their properties vary with bedrock. On dry aspects or well-drained granites, the forests are typified by red stringybark (*Eucalyptus macrohyncha*), white gum (*Eucalyptus rossii*), broad-leaved peppermint (*Eucalyptus dives*), candlebark (*Eucalyptus rubida*), and brittle gum (*Eucalyptus mannifera*) with a diverse understorey of shrubs and grasses. Black sallee (*Eucalyptus stellulata*) is found along low altitude stream banks. On sedimentary rocks, or on moist aspects and at higher elevation, more common tree species include; blue gum (*Eucalyptus globulus*), alpine ash (*Eucalyptus delegatensis*), mountain gum (*Eucalyptus dalrympleana*), narrow-leaved peppermint (*Eucalyptus radiata*), manna gum (*Eucalyptus viminalis*), and brown barrel (*Eucalyptus fastigata*). Moist gullies support soft tree ferns (*Dickinsonia antactica*) with blackwood (*Acacia melanoxylon*), southern sassafras (*Atherosperma moschatum*) and hazel pomaderris (*Pomaderris aspera*).

Kxm Kings Cross Montane AA Montane

Areas marginal to Kings Cross Sub alpine plains where forest is found in warmer and moister locations. Geology and soils are similar to the sub alpine environment, average elevation about 1400m, local relief to 200m. Snow gum (*Eucalyptus pauciflora*) still dominates the vegetation but different aspects have alpine ash (*Eucalyptus delegatensis*) and mountain gum (*Eucalyptus dalrympleana*) communities.

Mam Main Range Montane AA Montane

Well-drained steep slopes on Silurian-Devonian gneissic granite, granite and granodiorite and Ordovician slate, chert, quartzite and phyllite. General elevation 1000 to 1500m but ecosystem boundaries vary with aspect. Soils are intermediate in character between low elevation texture-contrast profiles and higher elevation organic uniform profiles. Their properties vary with bedrock; gritty clay loams on granites and pedal red to yellow clay subsoils on meta-sediments.

Tall forests in moist, high rainfall environments with; alpine ash (*Eucalyptus delegatensis*), mountain gum (*Eucalyptus dalrympleana*), narrow-leaved peppermint (*Eucalyptus radiata*), manna gum (*Eucalyptus viminalis*), brown barrel (*Eucalyptus fastigata*), snow gum (*Eucalyptus pauciflora*), mountain hickory wattle (*Acacia obliquinervia*) and silver wattle (*Acacia dealbata* ssp. *alpina*). Moist gullies support soft tree fern (*Dicksonia antarctica*), with blackwood (*Acacia melanoxylon*), southern sassafras (*Atherosperma moschatum*) and hazel pomaderris (*Pomaderris aspera*). Sphagnum bogs (*Sphagnum cristatum*) with candle heath (*Richea continentis*) and swamp heath (*Epacris paludosa*) occur at the head of most creeks.

Nmr Namadgi Range Montane AA Montane

High ranges on Silurian-Devonian massive and gneissic granites, general elevation 1100 to 1600m, local relief 300m. Moderately deeply weathered granite with coarse gritty uniform sandy loams between outcrops and tors on ridges and steep slopes to red-yellow texture-contrast soils below about 1200m. On dry aspects or well-drained granite soils, the more open

forests are typified by red stringybark (*Eucalyptus macrohyncha*), white gum (*Eucalyptus rossii*), broad-leaved peppermint (*Eucalyptus dives*), candlebark (*Eucalyptus rubida*) and brittle gum (*Eucalyptus mannifera*) with a diverse understorey of shrubs and grasses. Moist aspects carry alpine ash (*Eucalyptus delegatensis*) and mountain gum (*Eucalyptus dalrympleana*) communities.

Umb Upper Murrumbidgee Valley AA Montane
Narrow valley and channels system of the Murrumbidgee above Cooma in montane and sub alpine communities. The stream crosses numerous geological units and the valley is dominated by sand and gravel alluvium with small fans alluvial fans developed at the mouths of tributary streams where they impinge on the floodplain. Shallow uniform sandy soils with moderate levels of organic matter and numerous areas of poor drainage. Dominant trees vary with altitude and rainfall; snow gum (*Eucalyptus pauciflora*) and black sallee (*Eucalyptus stellulata*) woodland at higher levels and red stringybark (*Eucalyptus macrorhyncha*), white gum (*Eucalyptus rossii*) dry forest at lower levels. Most of the valley is open sod tussock grassland with areas of bog and swamp.

Yck Yarrangobilly - Cooleman Karst AA Montane
Steep hills and deep valleys on limited areas of Silurian and Devonian massive limestone and marble including small unmapped occurrences at Jounama Creek, Quambat Flat and Lick Hole. Major karst features including caves and dolines are well developed in the larger deposits. Rock outcrop is common and soils developed in deep grikes are typically red, red-brown and brown structured loams and clay loams with alkaline pH.

The vegetation reflects local communities on adjacent rocks but usually includes unusual species adapted to the high pH and calcium levels.

BBS - Descriptions for Landscapes in the Brigalow Belt South Bioregion

Meso: BBS Collarenebri Interfluve

Ctd Collarenebri Tablelands and Downs BBS Collarenebri Interfluve
Collarenebri Tablelands and Downs ecosystem is represented by the *Araluen* land system.

Low ridges, rounded hills and foot slopes on horizontal Cretaceous claystone, siltstone and sandstone, general elevation 150 to 1290m, local relief 3 to 7m. Shallow to moderately deep red earths, lithosols and calcareous red earths often with ferruginised and siliceous gravel. Soils become deeper down slope and accumulate calcium carbonate in drainage lines. Dense to scattered bimble box *(Eucalyptus populnea*), wilga (*Geijera parviflora*), white cypress pine (*Callitris glaucophylla*), budda (*Eremophila mitchellii*), belah (*Casuarina cristata*), nepine (*Capparis lasiantha*), warrior bush (*Apophyllum anomalum*), ironwood (*Acacia excelsa*), wild lemon (*Canthium oleifolium*), and wild orange (*Capparis mitchellii*) with abundant grasses; red-leg grass (*Bothriochloa macra*), button grass (*Dactyloctenium radulans*), windmill grass (*Chloris truncata*), mulga grass (*Thyridolepis mitchelliana*), wire grass (*Aristida* sp.), copper burrs (*Sclerolaena* sp.) and forbs.

Meso: BBS Gwydir - Croppa Creek

Crf Croppa Creek Channels and Floodplains BBS Gwydir - Croppa Creek

Channels, floodplain, terraces and lagoons of Croppa Creek on Quaternary alluvium, general elevation 275 to 200m, local relief 10m. Narrow levees with brown sandy clay and heavy grey clay. Fringing river red gum *(Eucalyptus camaldulensis*) only a few trees wide in the channel and on levees extending to heavier soils on the floodplain with myall (*Acacia pendula*), rosewood (*Alectryon oleifolium*) and belah (*Casuarina cristata*) woodland.

Meso: BBS Gwydir - Croppa Creek Outwash

Ccp Croppa Clay Plains BBS Gwydir - Croppa Creek Outwash
Extensive alluvial fans and rolling downs on Quaternary sediments and planar surfaces of Cretaceous calcareous silty sandstones and shales on either side of Croppa and Gil Gil Creeks draining from the Yallaroi Basalts Ecosystem. General elevation 275 to 230m, local relief 5m. Deep grey to black clay uniform cracking soils of moderate fertility. Bimble box *(Eucalyptus populnea*) and belah (*Casuarina cristata*) woodlands, remnant brigalow (*Acacia harpophylla*) on heavier soils with gilgai. Patches of myall (*Acacia pendula*) and rosewood (*Alectryon oleifolium*) with grasses.

Meso: BBS Lake Basins

Ohl Old Harbour Lagoon BBS Lake Basins
Isolated closed drainage basin forming a circular ephemeral lagoon about 2km in diameter at 360m elevation. Lunette with woodland on the eastern shore, tree species unknown. Similar to many dry lakes in the Western Division but much further east than most.

Meso: BBS Liverpool Plains

Brc Breeza Hills Basalt Caps BBS Liverpool Plains
Tertiary basalts over Jurassic quartz sandstones and alluvial sediments derived from these. Undulating low stony hills, long slopes with sandy wash and heavy clays in the valley floors. General elevation 350 to 760m, local relief 250m. Stony black or red-brown loam and clay loam on basalt ridges and slopes. White box *(Eucalyptus albens*), white cypress pine (*Callitris glaucophylla*), kurrajong (*Brachychiton populneus*), rough-barked apple (*Angophora floribunda*), broad-leaf hopbush (*Dodonaea viscosa*) and grasses on ridges. Black cypress pine (*Callitris endlicheri*), Port Jackson fig (*Ficus rubiginosa*), red ash (*Alphitonia excelsa*), budda (*Eremophila mitchellii*), wilga (*Geijera parviflora*), rosewood (*Alectryon oleifolium*) and whitewood (*Atalaya hemiglauca*) on lower slopes.

Brz Breeza Hills Sandstone - Shale Slopes BBS Liverpool Plains
Ridges and stepped low hills on horizontal upper Permian sandstone, conglomerate and coal measures, Triassic quartz and lithic sandstone and Jurassic quartz and lithic sandstone with thin shales. Exhumed landscapes exposed by erosion of Tertiary Liverpool range basalts. General elevation 350 to 680m, local relief 120m. Yellow and brown earthy sands, red-brown earths on long slopes, yellow harsh texture-contrast soils in streamlines. White box *(Eucalyptus albens*), yellow box *(Eucalyptus melliodora*), tumbledown red gum *(Eucalyptus dealbata*), Blakely's red gum *(Eucalyptus blakelyi*), narrow-leaved ironbark *(Eucalyptus crebra*), white cypress pine (*Callitris glaucophylla*), rosewood (*Alectryon oleifolium*), wilga (*Geijera parviflora*), motherumbah (*Acacia cheelii*) and kurrajong (*Brachychiton populneus*) with grassy understorey. River red gum *(Eucalyptus camaldulensis*) on all streams.

Kgs Kerringle Outwash Sands BBS Liverpool Plains
Outwash slopes and small coalescing alluvial fans with multiple incised streams on Tertiary and Quaternary sands derived from the Bugaldie Uplands ecosystem. General elevation 300 to 400m, local relief 20m. Red loamy sand, loam and brown clays. Bimble box *(Eucalyptus populnea*) with white cypress pine (*Callitris glaucophylla*), wilga (*Geijera parviflora*) and

budda (*Eremophila mitchellii*) on red soils, belah (*Casuarina cristata*) and brigalow (*Acacia harpophylla*) on brown clays.

Lip Liverpool Alluvial Plains BBS Liverpool Plains
Quaternary alluvial plains and outwash fans derived from Tertiary basalts. Permian and Triassic quartz sandstones with minor basalt caps. Undulating hills and sloping plains with alluvial channels and floodplains. General elevation 300 to 350m, local relief <10m. Extensive black earths on low angle slopes. Deep black and brown cracking clays, alluvial soils and red or brown texture-contrast soils on slopes below sandstone. Open grasslands of plains grass (*Austrostipa aristiglumis*), *Panicum* sp., windmill grass (*Chloris truncata*) and blue grass (*Dichanthium sericeum*) on black earths with occasional myall (*Acacia pendula*), white box *(Eucalyptus albens*), yellow box *(Eucalyptus melliodora*), bimble box *(Eucalyptus populnea*) and wilga (*Geijera parviflora*). River red gum *(Eucalyptus camaldulensis*) along streams.

Mop Mooki - Namoi Channels and Floodplains BBS Liverpool Plains
Channels, floodplains and terraces of the Mooki and Namoi Rivers on the Liverpool Plains Ecosystem in Quaternary fluvial sediments. General elevation 275 to 350m, local relief 20m. Brown clays and recent alluvium. River red gum *(Eucalyptus camaldulensis*), river oak (*Casuarina cunninghamiana*), rough-barked apple (*Angophora floribunda*) with plains grass (*Austrostipa aristiglumis*) and couch (*Sporobolus mitchelli*).

Mos Mooki Swamps and Lagoons BBS Liverpool Plains
Wetlands on Quaternary fluvial plans associated with the Mooki catchment on the Liverpool Alluvial Plains Ecosystem. The largest feature is the ephemeral Lake Goran with clay lunette at 310m elevation. Deep grey clays with high carbonate and sodium content over a shallow saline aquifer. Sparse river red gum *(Eucalyptus camaldulensis*) and bimble box *(Eucalyptus populnea*) on grasslands of plains grass (*Austrostipa aristiglumis*) wire grasses (*Aristida* sp.) and wallaby grass (*Austrodanthonia* sp.). Cumbungi (*Typha orientalis*) and lignum (*Muehlenbeckia cunninghamii*) on claypans with a fringe of river red gum *(Eucalyptus camaldulensis*).

Nbp Nombi Plateau and Pinnacles BBS Liverpool Plains
Rounded and conical volcanic peaks and domes of Jurassic trachyte with low angle debris slopes standing above rolling plateau and low hills, general elevation 500 to 770m, local relief to 250m. Soils vary with slope position, relatively light textured and shallow on rubble to heavy brown to black clays on flats and valley floors. Open woodland and extensive grasslands, slender rat's tail grass (*Sporobolus elongatus*) and early spring grass (*Eriochloa psuedo-acrotricha*) on rubble slopes, spear grasses (*Austrostipa* sp.) with *Bothriochloa* sp. at lower levels on heavier soils.

Unl Upper Namoi Swamps and Lagoons BBS Liverpool Plains
Linear swamps and abandoned channels on the floodplain of the Namoi River in Quaternary fluvial sediments, usually separated from the channel by low levees, elevation 250m, local relief <5m. Fringing river red gum *(Eucalyptus camaldulensis*) and bimble box *(Eucalyptus populnea*) with grasses, cumbungi (*Typha orientalis*) and common reed (*Phragmites australis*).

Meso: BBS Liverpool Range

Cto Coolah Tops BBS Liverpool Range
High ridge top plateau remnants on the western end of the Liverpool Range on Tertiary basalt flows. General elevation 1000 to 1250m, local relief 75m. Shallow stony self-mulching dark coloured clay loams and clays. Open grasslands with silvertop stringybark *(Eucalyptus laevopinea*), mountain gum *(Eucalyptus dalrympleana*), manna gum *(Eucalyptus viminalis*)

and snow gum *(Eucalyptus pauciflora*) on crests, rough-barked apple (*Angophora floribunda*), yellow box *(Eucalyptus melliodora*), apple box *(Eucalyptus bridgesiana*) and blackwood (*Acacia melanoxylon*) on lower slopes.

Liv Liverpool Range Valleys and Footslopes BBS Liverpool Range

Multiple Tertiary basalt flows with intervening sediments and ash fall material, overlying Jurassic quartz sandstones and shale. Long slopes below the Liverpool Tops ecosystem, general elevation 450 to 1000m, local relief to 400m. Shallow stony clay soils on steep slopes grading to deep black earths on lower slopes. Tallow wood *(Eucalyptus microcorys*), blackbutt *(Eucalyptus pilularis*) and blue gum *(Eucalyptus globulus*) on basaltic eastern slopes with small areas of vine forest. White box *(Eucalyptus albens*) with rough-barked apple (*Angophora floribunda*), belah (*Casuarina cristata*) in the creeks on northern aspects. Yellow box *(Eucalyptus melliodora*), manna gum *(Eucalyptus viminalis*), Blakely's red gum *(Eucalyptus blakelyi*) and sweet pittosporum (*Pittosporum undulatum*) on southern aspects. Warm temperate rainforest elements of brown beech (*Pennantia cunninghamii*) with fern understorey along creek lines at the eastern end of the range. Sandstone gullies with grey gum *(Eucalyptus punctata*), narrow-leaved stringybark *(Eucalyptus sparsifolia*), broad-leaved ironbark *(Eucalyptus fibrosa* ssp. *fibrosa*), currawang (*Acacia doratoxylon*), forest phebalium (*Phebalium ambiens*), Australian boxthorn (*Bursaria spinosa*), and hopbush (*Dodonaea* sp.). River oak (*Casuarina cunninghamiana*) along lower streams. Extensive open areas with grasslands merging to the Liverpool Alluvial Plains Ecosystem.

Lta Liverpool Tops BBS Liverpool Range

Undulating plateau top above 1000m altitude, on Tertiary basalt with steep margins grading down to the Liverpool Range Valleys and Footslopes Ecosystem, local relief 200 to 500m. Stony red brown loams, open forest of silvertop stringybark *(Eucalyptus laevopinea*), manna gum *(Eucalyptus viminalis*) and mountain gum *(Eucalyptus dalrympleana*) with snow gum *(Eucalyptus pauciflora*) in cold air drainage hollows. Small areas of dry rainforest in sheltered locations with southern aspects on the eastern end of the range.

Meso: BBS Pilliga

Bup Bugaldie Uplands BBS Pilliga

Stepped stony ridges on Jurassic quartz sandstone with some conglomerate, shale and occasional interbedded basaltic volcanic rocks. General elevation 350 to 490m local relief 50 to 150m, extensive joint controlled stream network. Abundant outcrop on ridge tops with thin discontinuous soils with stony, sandy profiles and low nutrients. Down slope texture-contrast soils are more common typically with harsh clay subsoils and deep uniform or gradational yellow-brown sands on the valley floors. Patches of green mallee *(Eucalyptus viridis*) and white mallee *(Eucalyptus dumosa*), clumps of curracabah (*Acacia concurrens*) and motherumbah (*Acacia cheelii*) amongst red ironbark *(Eucalyptus sideroxylon*) and black cypress pine (*Callitris endlicheri*) with shrubby understorey including rusty spider flower (*Grevillea floribunda*), mint bush (*Prostanthera* sp.), nodding blue lily (*Stypandra glauca*) and rock fern (*Cheilanthes sieberi*) on ridges and stony slopes. Narrow-leaved ironbark *(Eucalyptus crebra*), red stringybark *(Eucalyptus macrorhyncha*), black cypress pine (*Callitris endlicheri*), brown bloodwood (*Corymbia trachyphloia*) and rough-barked apple (*Angophora floribunda*) on the sandy flats. White box *(Eucalyptus albens*) and Port Jackson fig (*Ficus rubiginosa*) on the volcanics.

Cas Cassilis Slopes BBS Pilliga

Undulating hills with dendritic drainage on sub-horizontal Jurassic and Triassic quartz sandstone, siltstone and shale. General elevation 400 to 600m, local relief 100m. Topographically below the Liverpool Range basalts but partly influenced by them on some valley floors. White box *(Eucalyptus albens*), yellow box *(Eucalyptus melliodora*), Blakely's red gum *(Eucalyptus blakelyi*), and rough-barked apple (*Angophora floribunda*), with grasses.

Cup Cubbo Uplands BBS Pilliga

Pilliga horizontal Jurassic quartz sandstones, limited shales, Tertiary basalt caps and plugs plus the sediments derived from these rocks. Stepped sandstone ridges with low cliff faces and high proportion of rock outcrop. Long gentle outwash slopes intersected by sandy streambeds and prior stream channels. A few patches of heavy clay. General elevation 400 to 550m, local relief 50m. On sandstone, the ridge tops have thin discontinuous soils with stony, sandy profiles and low nutrients. Down slope texture-contrast soils are more common typically with harsh clay subsoils and in the valley floors sediments tend to be sorted into deep sands with yellow earthy profiles, harsh grey clays, or more texture-contrast soils with a greater concentration of soluble salts. The sandstone outcrop areas support various forests and woodlands including; blue-leaved ironbark *(Eucalyptus fibrosa* ssp. *nubila*), scribbly gum *(Eucalyptus rossii*), black cypress pine (*Callitris endlicheri*), whitewood (*Atalaya hemiglauca*), and rough-barked apple (*Angophora floribunda*). Stony hills in the north of the region carry mallee patches with; silver-leaved ironbark *(Eucalyptus melanophloia*), spotted gum *(Corymbia maculata*), and smooth-barked apple (*Angophora costata*). Gentler sandstone slopes over most of the region carry; narrow-leaved ironbark *(Eucalyptus crebra*), white cypress pine (*Callitris glaucophylla*), red stringybark *(Eucalyptus macrorhyncha*), patches of green mallee *(Eucalyptus viridis*) and broombush heath (*Melaleuca uncinata*). In western and northern sections on texture-contrast or more uniform harsh clay soils forests of Pilliga box *(Eucalyptus pilligaensis*), grey box *(Eucalyptus microcarpa*), bimble box *(Eucalyptus populnea*), and fuzzy box *(Eucalyptus conica*) are found with stands of bull oak (*Allocasuarina luehmannii*), rosewood (*Alectryon oleifolium*), whitewood (*Atalaya hemiglauca*), wilga (*Geijera parviflora*), belah (*Casuarina cristata*), yarran (*Acacia homalophylla*), and budda (*Eremophila mitchellii*).

Gos Goonoo Slopes BBS Pilliga

Extensive undulating to stepped low hills with long slopes on sub-horizontal Triassic/Jurassic quartz sandstone, conglomerates, siltstone, shale and some coal. General elevation 300 to 500m with overall westerly slope, poorly defined drainage network, local relief to 30m. Stony yellow earths with sandstone outcrop on ridgelines to yellow harsh texture-contrast soils in shallow valleys. Broad-leaved ironbark *(Eucalyptus fibrosa* ssp. *fibrosa*) and black cypress pine (*Callitris endlicheri*) on ridges, broad-leaved ironbark, narrow-leaved ironbark *(Eucalyptus crebra*), red ironbark *(Eucalyptus sideroxylon*), fringe myrtle (*Calytrix tetragona*), spur-wing wattle (*Acacia triptera*), dainty phebalium (*Phebalium obcordatum*), daphne heath (*Brachyloma daphnoides*) on slopes with patches of green mallee *(Eucalyptus viridis*), Dwyer's mallee gum *(Eucalyptus dwyeri*) and broombush (*Melaleuca uncinata*). Grey box *(Eucalyptus microcarpa*), red ironbark *(Eucalyptus sideroxylon*), red stringybark *(Eucalyptus macrorhyncha*), fuzzy box *(Eucalyptus conica*) and Blakely's red gum *(Eucalyptus blakelyi*) with knob sedge (*Carex inversa*), and tall sedge (*Carex appressa*) along streams.

Meh Merrygoen Hills and Slopes BBS Pilliga

Low hills and ranges on Triassic/Jurassic conglomerate, quartz sandstone and claystone with exposures of undifferentiated Palaeozoic schist, phyllite and slate in valleys. General elevation 400 to 550m, local relief 50m. Shallow stony yellow earths with sandstone outcrop on ridgelines merging to yellow harsh texture-contrast soils in shallow valleys. Broad-leaved ironbark *(Eucalyptus fibrosa* ssp. *fibrosa*), narrow-leaved ironbark *(Eucalyptus crebra*), red ironbark *(Eucalyptus sideroxylon*), red stringybark *(Eucalyptus macrorhyncha*), black cypress pine (*Callitris endlicheri*) with fringe myrtle (*Calytrix tetragona*), spur-wing wattle (*Acacia triptera*), sword-leaf wattle (*Acacia gladiiformis*), drooping cassinia (*Cassinia arcuata*), and silver wattle (*Acacia dealbata*). Blakely's red gum *(Eucalyptus blakelyi*), grey box *(Eucalyptus microcarpa*) with grasses and sedges on valley floors.

Mlh Mollyan Hills BBS Pilliga

Flat topped low ridges and rises on Jurassic lithic sandstone, conglomerate and interbedded dolerite. General elevation 500 to 600m, local relief 50m. Shallow stony yellow earths with sandstone outcrop on ridgelines merging to yellow harsh texture-contrast soils down slope. Shallow stony brown clay loams on basalt. Red ironbark *(Eucalyptus sideroxylon*), red stringybark *(Eucalyptus macrorhyncha*), black cypress pine (*Callitris endlicheri*), narrow-leaved ironbark *(Eucalyptus crebra*), with fringe myrtle (*Calytrix tetragona*), spur-wing wattle (*Acacia triptera*), sword-leaf wattle (*Acacia gladiiformis*), drooping cassinia (*Cassinia arcuata*), and silver wattle (*Acacia dealbata*) on sandstone. White box *(Eucalyptus albens*), Blakely's red gum *(Eucalyptus blakelyi*) and grey box *(Eucalyptus microcarpa*) with grasses on dolerite.

Myg Myall Glen Basalts BBS Pilliga
Low rises above the plain on Tertiary basalt, elevation approximately 250m, local relief not known. Basalt 5m thick probably derived as a valley fill from the Warrumbungles. No available data on soils or vegetation. Very limited area.

Pup Purlewaugh Plains BBS Pilliga
Rolling elevated plains on sub-horizontal Jurassic lithic sandstone, shale, claystone and thin coal measures and Quaternary alluvium, general elevation 500 to 570m, local relief <30m. Yellow harsh texture-contrast soils on slopes grading to deep earthy sands and red earths on foot slopes. Woodland and forest of narrow-leaved ironbark *(Eucalyptus crebra*), silver-leaved ironbark *(Eucalyptus melanophloia*), Blakely's red gum *(Eucalyptus blakelyi*), Pilliga box *(Eucalyptus pilligaensis*), brown bloodwood (*Corymbia trachyphloia*), white cypress pine (*Callitris glaucophylla*), black cypress pine (*Callitris endlicheri*), budda (*Eremophila mitchellii*), wilga (*Geijera parviflora*), *Macrozamia* sp. several acacia (*Acacia* sp.) and grasses.

Trp Trinkey Plateau BBS Pilliga
Undulating plains and low hills on sub-horizontal Jurassic quartz sandstone, general elevation 500 to 670m, local relief 50m. Yellow harsh texture-contrast soils, earthy sands and red earths. Black cypress pine (*Callitris endlicheri*) with motherumbah (*Acacia cheelii*) and curracabah (*Acacia concurrens*) on sandstone ridges, narrow-leaved ironbark *(Eucalyptus crebra*), silver-leaved ironbark *(Eucalyptus melanophloia*), Blakely's red gum *(Eucalyptus blakelyi*), grey box *(Eucalyptus microcarpa*), brown bloodwood (*Corymbia trachyphloia*), red stringybark *(Eucalyptus macrorhyncha*), with several acacia (*Acacia* sp.) and grasses on slopes. River red gum *(Eucalyptus camaldulensis*) and rough-barked apple (*Angophora floribunda*) along streams.

Ucp Upper Castlereagh Alluvial Plains BBS Pilliga
Northern Outwash Tertiary and Quaternary alluvial fans and stream terraces. Sloping plains with alluvial fans that are coarser and steeper than the Gwydir Fans downstream General elevation 420 to 580m, local relief 5 to 30m. Red loams and heavy brown clays. Bimble box *(Eucalyptus populnea*) with white cypress pine (*Callitris glaucophylla*), wilga (*Geijera parviflora*) and budda (*Eremophila mitchellii*) on red soils, belah (*Casuarina cristata*) and brigalow (*Acacia harpophylla*) on brown clays.

Ucl Upper Castlereagh Channels and Floodplains BBS Pilliga
Channel, floodplain and terraces on the Castlereagh River diverted around the Warrumbungle central volcano. General elevation 350 to 600m, local relief 25 to 40m. Deep sand in the streambed and banks, brown loamy sand on Quaternary alluvium on the floodplain and terraces. Mixed river red gum *(Eucalyptus camaldulensis*) and river oak (*Casuarina cunninghamiana*) along the channel, yellow box *(Eucalyptus melliodora*) and rough-barked apple (*Angophora floribunda*) with grassy understorey on the floodplain and terraces.

Meso: BBS Pilliga Outwash

Bcf Baradine - Coghill Channels and Floodplains BBS Pilliga Outwash
Sandy incised channels and distributary streams on Quaternary alluvium in fans of Coghill and Baradine Creeks flowing from the sandstones of the Pilliga forest. General elevation 170 to 210m, local relief 10m. Deep texture-contrast soils with harsh clay subsoils, grey clay with gilgai and uniform deep yellow sands. Sediments and soils become finer down valley merging with the Coghill Alluvial Plains ecosystem. Gallery woodland dominated by river red gum *(Eucalyptus camaldulensis*) along the channels. Other species including; bimble box *(Eucalyptus populnea*), Pilliga box *(Eucalyptus pilligaensis*), Blakely's red gum *(Eucalyptus blakelyi*), white cypress pine (*Callitris glaucophylla*) and red ironbark *(Eucalyptus sideroxylon*) and occasional silver-leaved ironbark *(Eucalyptus melanophloia*).

Bdp Baradine Alluvial Plains BBS Pilliga Outwash
Similar to Baradine - Coghill Channels and Floodplains Ecosystem with slightly more western influence in the vegetation. floors and channels on Quaternary alluvial fans derived from Jurassic quartz sandstone. Long shallow slopes of alluvial fans, broken by abandoned stream channels, patches of heavy grey clay and incised sandy bed streams. General elevation 280 to 160m, local relief 5 to 15m. Deep texture-contrast soils with harsh clay subsoils, grey clay with gilgai and linear strings of uniform deep yellow sands (sand monkeys). Limited areas of source bordering dune on the eastern side of the main streams. Sediments and soils become finer down fan merging with the Coghill Alluvial Plains ecosystem. Gallery woodland dominated by Baradine red gum *(Eucalyptus dealbata*) and river red gum *(Eucalyptus camaldulensis*) along the channels. Other species include; bimble box *(Eucalyptus populnea*), Pilliga box *(Eucalyptus pilligaensis*), Blakely's red gum *(Eucalyptus blakelyi*), white cypress pine (*Callitris glaucophylla*), red ironbark *(Eucalyptus sideroxylon*) and silver-leaved ironbark *(Eucalyptus melanophloia*). Belah (*Casuarina cristata*), yarran (*Acacia homalophylla*), budda (*Eremophila mitchellii*), wilga (*Geijera parviflora*), whitewood (*Atalaya hemiglauca*), warrior bush (*Apophyllum anomalum*) and rosewood (*Alectryon oleifolium*) on heavier soils.

Cgp Coghill Alluvial plains BBS Pilliga Outwash
Distal parts of the Quaternary alluvial fans largely derived from Jurassic quartz sandstone on streams draining from the Pilliga forests. Long gentle slopes broken by sandy abandoned stream channels (sand monkeys), patches of heavy grey clay, and contemporary incised stream channels. General elevation 200 to 280m, local relief 5 to 9m. Deep texture-contrast soils with harsh clay subsoils, grey clay with gilgai. Open forest of white cypress pine (*Callitris glaucophylla*), bimble box *(Eucalyptus populnea*), Pilliga box *(Eucalyptus pilligaensis*), Blakely's red gum *(Eucalyptus blakelyi*), and red ironbark *(Eucalyptus sideroxylon*). Brown bloodwood (*Corymbia trachyphloia*) and grass trees (*Xanthorrhoea* sp.) on sand monkeys. Patches of bull oak (*Allocasuarina luehmannii*) or brigalow (*Acacia harpophylla*) on gilgai in heavy clay. Baradine red gum *(Eucalyptus dealbata*) and river red gum *(Eucalyptus camaldulensis*) in creek lines.

Meso: BBS Talbragar Basalts

Dbb Dubbo Basalts BBS Talbragar Basalts
Slightly elevated plains and low hills on flat lying Tertiary basalt and trachyte flows, roughly parallel to the present course of the Talbragar and Macquarie Rivers. General elevation 300 to 330m, local relief 10m. Shallow stony red-brown clay loam and clay, self-mulching and with moderate fertility. Open white box *(Eucalyptus albens*), yellow box *(Eucalyptus melliodora*) and rough-barked apple (*Angophora floribunda*) with diverse grasses.

Meso: BBS Warrumbungles

Mnh Marron Hills BBS Warrumbungles

Wide linear ridge of Tertiary basalt flow parallel to the Castlereagh River. General elevation 400 to 500m, local relief 25m. Shallow stony red-brown and brown clay loam and clay gradational profiles of moderate fertility. Open white box *(Eucalyptus albens*), yellow box *(Eucalyptus melliodora*), grey box *(Eucalyptus microcarpa*), and rough-barked apple (*Angophora floribunda*) with diverse grasses.

Wbs Warrumbungle Slopes BBS Warrumbungles

Ridges and valleys rising to the Warrumbungle Tops Ecosystem, the lower part of a central volcanic complex of trachyte, basalts and pyroclastics with a diameter of about 25km. Radial drainage pattern, general elevation 580 to 1000m, local relief 50 to 250m. Stony debris slops with brown loamy matrix and brown texture-contrast soils on foot slopes with gravelly sands and loamy sands in alluvium. Woodlands of white box *(Eucalyptus albens*), narrow-leaved ironbark *(Eucalyptus crebra*), white cypress pine (*Callitris glaucophylla*) and acacia (*Acacia* sp.) on upper slopes. Yellow box *(Eucalyptus melliodora*), red stringybark *(Eucalyptus macrorhyncha*), Blakely's red gum *(Eucalyptus blakleyi*), rough-barked apple (*Angophora floribunda*) and river oak (*Casuarina cunninghamiana*) on lower slopes and stream edges. Scribbly gum *(Eucalyptus rossii*) and brown bloodwood (*Corymbia trachyphloia*) on lower sandstone slopes. Abundant grasses in all communities.

Wbt Warrumbungle Tops BBS Warrumbungles

Summit of dissected crater with trachyte plugs, spires, domes and eroded dykes of the Warrumbungle volcano. Elevation 1000 to 1210m, local relief on single features about 200m. Very large proportion of rock outcrop, thin stony brown loam in crevices. Dwyer's gum *(Eucalyptus dwyeri*), white cypress pine (*Callitris glaucophylla*), snow gum *(Eucalyptus pauciflora*) and tick bush (*Kunzea ambigua*) with acacia (*Acacia* sp.) and diverse heath patches.

Meso: BBS Yallaroi

Stm Strathmore Sandstones BBS Yallaroi

Rolling hills and downs on Jurassic calcareous lithic sandstone, quartz sandstone, siltstone, mudstone and thin coal seams. General elevation 250 to 400m, local relief 50 to 80m. Brown and grey, hard setting sandy clay loam over dark clay, and dark texture-contrast profiles with shallow gilgai. Mixed ironbarks *(Eucalyptus* sp.) and brown bloodwood (*Corymbia trachyphloia*) woodland, remnant brigalow (*Acacia harpophylla*) shrublands, extensively cleared.

Ybs Yallaroi Basalts BBS Yallaroi

Rolling hills and flat top ridges on Tertiary basalt flows over Jurassic quartz and lithic sandstone. General elevation 300 to 530m, local relief 100m. Shallow stony, red or brown, well-structured clays with high nutrient values. Similar but thicker soils on the slopes and the valley floors. Woodland and open forest of; white box *(Eucalyptus albens*), with silver-leaved ironbark *(Eucalyptus melanophloia*), white wood (*Atalaya hemiglauca*), bull oak (*Allocasuarina luehmannii*), ironbarks *(Eucalyptus* sp.), brown bloodwood (*Corymbia trachyphloia*) and brigalow (*Acacia harpophylla*) on alluvial clays. River red gum *(Eucalyptus camaldulensis*) on all streams.

BHC - Descriptions for Landscapes in the Broken Hill Complex Bioregion

Meso: BHC Barrier

Bps Barrier Alluvial Plains BHC Barrier

Barrier Alluvial Plains ecosystem includes parts of six land systems: *Allandy, Caloola, Conservation, Fowlers, Langawirra* and *Mundi Mundi.*

Extensive Quaternary alluvial and colluvial plains with aeolian deposition, narrow drainage lines with levees, moderately scalded back plains and terminal flood-plains with pans and extensive gilgai, relief 2 to 10m. Red and brown texture-contrast soils, some hard-setting, some with strong surface crusts. Areas of low dunes of deep red clayey sand, sandy earths. Deep self-mulching brown and grey cracking clays, saline calcareous and gypsic at variable depths along drainage tracts.

Treeless to sparse mulga (*Acacia aneura*), prickly wattle (*Acacia victoriae*), belah (*Casuarina cristata*) whitewood (*Atalaya hemigluaca*), narrow-leaf hopbush (*Dodonea attenuata*), bladder saltbush (*Atriplex vesicaria*), low bluebush (*Maireana astrotricha*), copperburr (*Sclerolaena* sp.), and Mitchell grass (*Astrebla* sp.) with sparse bladder saltbush (*Atriplex vesicaria*). Dunes with scattered mulga, white cypress pine (*Callitris glaucophylla*), scattered hopbush and abundant grasses. River red gum *(Eucalyptus camaldulensis*), prickly wattle and western boobialla (*Myoporum montanum*) on sub-terminal minor creeks. Canegrass (*Eragrostis australasica*) and fringing black box *(Eucalyptus largiflorens*) on pans.

Bds Barrier Downs BHC Barrier

Barrier Downs ecosystem includes parts of nine land systems: *Bancannia, Cymbric, Floods Creek, Gap Hills, Katalpa, Nine Mile, Nundora, Nuntherungie* and *Oak Vale.*

A complex landscape of the low strike ridges of rock outcrop, slopes and outwash areas of the Barrier Ranges. Steeply rolling lowlands on pre-Cambrian dolomite and calcareous shale and steeply dipping Devonian sandstone and conglomerate, with dense incised drainage, relief to 30m. Lithosols or shallow calcareous sandy loams on ridges, contour banded slopes of alternating stony red desert loams and stone-free red clays or solonized brown soils on long slopes. Dunes of deep clayey sand. Stony reddish-brown calcareous sandy loams, along drainage tracts, alluvial flats with brown self-mulching cracking clays.

Ridges with scattered mulga (*Acacia aneura*), prickly wattle (*Acacia victoriae*), low bluebush (*Maireana astrotricha*), scattered black bluebush (*Maireana pyramidata*), dead finish (*Acacia tetragonophylla*), some pearl bluebush (*Maireana sedifolia*) and isolated harlequin fuchsia (*Eremophila duttonii*). Slopes with isolated mulga and needlewood (*Hakea leucoptera*) with scattered shrubs; local stands of dense low bluebush, contour banded bladder saltbush (*Atriplex vesicaria*), cabbage-tree wattle (*Acacia cana*), belah (*Casuarina cristata*), and pearl bluebush (*Maireana sedifolia*), with local clumps of moderately dense belah (*Casuarina cristata*) and mulga, abundant bottlewashers (*Enneapogon* sp.) and copperburr (*Sclerolaena* sp.). Flats with copperburr, thorny saltbush (*Rhagodia* sp*inescens*) and grasses and drainage lines with prickly wattle, western boobialla (*Myoporum montanum*), sandalwood (*Santalum lanceolatum*), rosewood (*Alectryon oleifolium*), belah (*Casuarina cristata*), white cypress pine (*Callitris glaucophylla*) and black box *(Eucalyptus largiflorens*). River red gum *(Eucalyptus camaldulensis*) along larger streams.

Bfl Barrier Fresh Lakes and Swamps BHC Barrier

Barrier Fresh Lakes and Swamps ecosystem includes parts of two land systems: *Fort Grey*, and *Karumpito*.

Small lakes with low lunettes in Quaternary dunefields, relief 3 to 15m. Lakebeds of cracking or non-cracking clays and solonized brown soils, with sandy deposits around shorelines and lunettes on the eastern margin.

Bimble box *(Eucalyptus populnea*) or black box *(Eucalyptus largiflorens*) and hybrids around shorelines. Pans and swamps of deep, widely cracking self-mulching grey and brown clays with canegrass (*Eragrostis australasica*) and lignum (*Muehlenbeckia cunninghamii*) in centres and black bluebush (*Maireana pyramidata*) on margins. Sandy calcareous gypseous soil on lunettes with rosewood (*Alectryon oleifolium*), belah (*Casuarina cristata*), punty bush (*Senna eremophila*), black bluebush, twinleaf (*Zygophyllum* sp.), isolated mulga (*Acacia aneura*) and bottlewashers (*Enneapogon* sp.).

Brs Barrier Ranges BHC Barrier

Barrier Ranges ecosystem includes parts of six land systems: *Barrier, Faraway, Mulga Dam, Nundooka, Umberumberka* and *Wonaminta.*

Densely dissected ranges mainly of lower to middle Proterozoic metamorphic rocks including several varieties of gneiss, schist, amphibolite and pegmatites with north-east structural trends. Steep, partly bevelled, asymmetric strike ridges on associated dipping upper Proterozoic quartzite, sandstone and shales. Relief 30 to 200m. Trellised drainage patterns, narrow and incised in higher relief country. Rock outcrop and lithosols on upper slopes, red texture-contrast soils, locally calcareous, and contour banded steps on lower slopes. Shallow reddish-brown calcareous stony loamy sands on calcareous sandstone. Drainage tracts with reddish brown and yellowish-brown texture-contrast soils with coarse sands in channels.
Rocky crests with little soil support scattered mulga (*Acacia aneura*), dead finish (*Acacia tetragonophylla*), black bluebush (*Maireana pyramidata*) and bottlewashers (*Enneapogon* sp.). Upper slopes carry mulga, black bluebush, pearl bluebush (*Maireana sedifolia*), bladder saltbush (*Atriplex vesicaria*), copperburr (*Sclerolaena* sp.) and grasses. Thorny saltbush (*Rhagodia* sp*inescens*), prickly wattle (*Acacia victoriae*), belah (*Casuarina cristata*) and black bluebush on lower slopes. Alluvial flats support black bluebush, bladder saltbush (*Atriplex vesicaria*), belah, prickly wattle, copperburr, bottlewashers (*Enneapogon* sp.), *Sida* sp., and grasses. River red gum *(Eucalyptus camaldulensis*) along larger channels.

Bpl Barrier Salt Lakes and Playas BHC Barrier

Barrier Salt Lakes and Playas ecosystem is made up of part of the *Cobham* land system.

Widely distributed Quaternary saline lakes and clay playas with bare, flat, crusted floors of salty grey and brown clay. Pans with deep self-mulching brown cracking clays and brown clays with strong surface crusts, canegrass (*Eragrostis australasica*) and lignum (*Muehlenbeckia cunninghamii*) in centres with chenopods and prickly wattle (*Acacia victoriae*) along margins. Swamp basins and channels with deep self-mulching brown and grey cracking clays, some with extremely deep and wide cracks. Shrubs and canegrass with fringing black box *(Eucalyptus largiflorens*) on pan margins with sandy surfaces over earthy pans. Lunettes to 10m, of deep, brown clayey sand with open mulga (*Acacia aneura*), turpentine (*Eremophila sturtii*), pearl bluebush (*Maireana sedifolia*) and forbs and grasses.

Bsp Barrier Sandplains BHC Barrier

Barrier Sandplains ecosystem includes parts of six land systems: *Duntroon, Haythorpe, Kars, Nelia, Nucha* and *Rodges*.

Extensive undulating Quaternary sandplains and alluvial plains with isolated low sandy rises and patches of broad east-west trending dunes and small and large drainage sinks occasional lakes, relief 5 to 10m. Sandy red earths and calcareous red earths, earthy pans at depth. Dunes of calcareous sandy earths or sands. Solonized brown soils in sinks with brown and grey cracking clay in pans.

Moderate to sparse mulga (*Acacia aneura*), belah (*Casuarina cristata*), leopardwood (*Flindersia maculosa*), nelia (*Acacia loderi*), rosewood (*Alectryon oleifolium*), punty bush

(*Senna eremophila*), clumps of turpentine (*Eremophila sturtii*), moderate to dense prickly wattle (*Acacia victoriae*), cabbage-tree wattle (*Acacia cana*), narrow-leaf hopbush (*Dodonaea attenuata*), emu bush (*Eremophila longifolia*) and boobialla (*Myoporum montanum*), variable speargrass (*Austrostipa variabilis*), copperburr (*Sclerolaena* sp.), cannonball burr (*Sclerolaena paradoxa*) and other grasses and forbs. Dunes with rosewood, red mallee *(Eucalyptus socialis*), narrow-leaf hopbush, turpentine and grasses. Fringing black box *(Eucalyptus largiflorens*), bimble box *(Eucalyptus populnea*) with canegrass (*Eragrostis australasica*) and lignum (*Muehlenbeckia cunninghamii*) on depressions.

Btl Barrier Tablelands BHC Barrier

Barrier Tablelands ecosystem includes parts of four land systems: *Flat Top, Lintis Vale, Pulgamurtie* and *Quarry View*.

Dissected rolling stony tablelands on Cretaceous claystone and sandstone, and Tertiary silcrete with breakaways, isolated silcrete-capped mesas and surrounding stony slopes and plains. Some associated Quaternary sandplain and occasional low dunes. Narrow incised drainage, relief 40 to 80m. Boulder strewn mesa tops, discontinuous rocky cliffs at the breakaway over slopes with stony mantles and brown loamy lithosols, calcareous red earths, solonised brown soils, red desert loams with red clays in gilgai depressions grade to deep neutral reddish-brown sands and loams in drainage tracts. Red sands and calcareous red earths on dunes and sandplains.

Essentially treeless tableland surfaces, with sparse shrubland, mainly of bladder saltbush (*Atriplex vesicaria*) and grasses, rare mulga (*Acacia aneura*), dead finish (*Acacia tetragonophylla*), cabbage-tree wattle (*Acacia cana*) and gidgee (*Acacia cambagei*). Stony slopes with sparse to moderate mulga, belah (*Casuarina cristata*) nelia (*Acacia loderi*), satiny bluebush (*Maireana georgei*), bladder saltbush (*Atriplex vesicaria*), black bluebush (*Maireana pyramidata*), prickly wattle (*Acacia victoriae*), copperburr (*Sclerolaena* sp.) and extensive Mitchell grass (*Astrebla* sp.). Open mulga with white cypress pine (*Callitris glaucophylla*) on dunes, dense mulga in sandy drainage lines.

Ctl Corona - Teamsters Limestone BHC Barrier

Corona - Teamsters Limestone ecosystem includes parts of two land systems: *Corona* and *Teamsters*.

Steep dipping upper Proterozoic limestones with associated conglomerate and sandstone forming low ridges, rolling hills and valleys flanking ranges, deeply incised drainage, relief to 30m. Rocky limestone ridges and footslopes, relief to 50m. Bouldery outcrop with thin calcareous lithosols.

Loose stony calcareous sandy loam on ridges with pearl bluebush (*Maireana sedifolia*), bottlewashers (*Enneapogon* sp.) and copperburr (*Sclerolaena* sp.). Contour banded slopes with bare stony desert loams alternating with red clay steps with bladder saltbush (*Atriplex vesicaria*) and grasses. Locally moderate curly mallee *(Eucalyptus gillii*), gallweed (*Zygophyllum apiculatum*), three-winged bluebush (*Maireana triptera*), copperburr, bottlewashers and forbs. Belah (*Casuarina cristata*) and rosewood (*Alectryon oleifolium*) elsewhere. Prickly wattle (*Acacia victoriae*) and black bluebush (*Maireana pyramidata*) on brown and red texture-contrast soils with river red gum *(Eucalyptus camaldulensis*) fringing major drainage tracts.

Meso: BHC Mootwingee

Mwa Mootwingee - Wonaminta Alluvial Plains BHC Mootwingee

Mootwingee-Wonaminta Alluvial Plains ecosystem includes parts of seven land systems: *Allandy, Caloola, Conservation, Fowlers*, *Sturt, Yancannia* and *Yapunyah.*

Broad to narrow floodplains, channels with levees and moderately scalded back plains. Terminal flood outs with pans and extensive gilgai. Relief 3 to 8m. Reddish-brown sandy and loamy, hard-setting texture-contrast soils often with loose sand cover. Brown clays with strong surface crusts, deep self-mulching brown and grey cracking clays saline calcareous and gypsic at variable depths. Banks of gravel and sandy beds in drainage channels.

Sparse mulga (*Acacia aneura*), whitewood (*Atalaya hemiglauca*), prickly wattle (*Acacia victoriae*), punty bush (*Senna eremophila*), bushy groundsel (*Senecio cunninghamii*), scattered bladder saltbush (*Atriplex vesicaria*), thorny saltbush (*Rhagodia* sp*inescens*), Sturt's pigface (*Aizoon quadrifidum*) with Mitchell grass (*Astrebla* sp.). Fringing river red gums *(Eucalyptus camaldulensis*) on larger channels and black box *(Eucalyptus largiflorens*) on pans with dense canegrass (*Eragrostis australasica*).

Mww Mootwingee - Wonaminta Downs BHC Mootwingee

Mootwingee-Wonaminta Downs ecosystem includes parts of eight land systems: *Bancannia, Cymbric, Flat Top, Katalpa, Nundora, Nuntherungie, Oakvale* and *Pulchra.*

Steeply rolling lowlands on pre-Cambrian dolomite and calcareous shale, with dense incised drainage, relief to 30m. Isolated silcrete capped mesas with discontinuous rocky cliffs at the breakaway, relief to 80m. Extensive contour banded plains, relief to 10m. Associated drainage lines and occasional dunes. Shallow calcareous sandy loams on crests often stony. Stony contour banded slopes with red desert loams and sparse vegetation alternating with bands of stone-free red clays in gilgai depressions. Loamy alluvial soils in drainage lines, dunes of deep red clayey sand.

Mainly treeless hillcrests and mesa tops with low bluebush (*Maireana astrotricha*), scattered black bluebush (*Maireana pyramidata*), some pearl bluebush (*Maireana sedifolia*) and isolated harlequin fuchsia (*Eremophila duttonii*), occasional mulga (*Acacia aneura*) and gidgee (*Acacia cambagei*). Slopes with isolated mulga, needlewood (*Hakea leucoptera*), scattered shrubs, local stands of dense low bluebush, black bluebush, bladder saltbush (*Atriplex vesicaria*), abundant bottlewashers (*Enneapogon* sp.) and copperburr (*Sclerolaena* sp.), Mitchell grass (*Astrebla* sp.) and sparse belah (*Casuarina cristata*). Dunes with open mulga, white cypress pine (*Callitris glaucophylla*), and abundant forbs and grasses. Alluvial valleys with prickly wattle (*Acacia victoriae*), cabbage-tree wattle (*Acacia cana*), sandalwood (*Santalum lanceolatum*), rosewood (*Alectryon oleifolium*), belah, white cypress pine and black box *(Eucalyptus largiflorens*) or river red gum *(Eucalyptus camaldulensis*) on drainage lines.

Mwd Mootwingee - Wonaminta Dunes BHC Mootwingee

Mootwingee-Wonaminta Dunes ecosystem is made up of part of the *Marrapina* land system.

Partly aligned low dunes of Quaternary age, relief to 6m. Deep red clayey sand, with narrow flat swales of sandy red earths overlying earthy pans, dense white cypress pine (*Callitris glaucophylla*) with sparse mulga (*Acacia aneura*) on dunes, canegrass (*Eragrostis australasica*) in swales.

Mwf Mootwingee - Wonaminta Footslopes BHC Mootwingee

Mootwingee-Wonaminta Footslopes ecosystem includes parts of two land systems: *Euramurtie* and *Tekum.*

Footslopes and low stony rises on flat-lying Devonian sandstones, relief to 20m. Red massive loamy sand with mantles of silcrete, scattered mulga (*Acacia aneura*), bluebush (*Maireana* sp.), dead finish (*Acacia tetragonophylla*), belah (*Casuarina cristata*), woollybutt (*Eragrostis eriopoda*), kerosene grass (*Aristida contorta*), copperburr (*Sclerolaena* sp.) and forbs.

Yellow-red loamy sands with narrow-leaf hopbush (*Dodonaea attenuata*) and turpentine (*Eremophila sturtii*) on lower slopes. Dunes and rises of red loamy sands, scattered mulga, rosewood (*Alectryon oleifolium*), ruby saltbush (*Enchylaena tomentosa*), belah, narrow-leaf hopbush. Prickly wattle (*Acacia victoriae*) and bimble box *(Eucalyptus populnea*) on minor streams, river red gum *(Eucalyptus camaldulensis*) and kangaroo grass (*Themeda triandra*) on major streams. Sand plains of calcareous and neutral red earths, scattered to moderate leopardwood (*Flindersia maculosa*), rosewood, belah, sparse narrow-leaf hopbush and punty bush (*Senna eremophila*), kerosene grass and wiregrass (*Aristida* sp.).

Mwl Mootwingee - Wonaminta Fresh Lakes BHC Mootwingee
Mootwingee-Wonaminta Fresh Lakes is made up of part of the *Fort Grey* land system.

Small shallow lakes with low lunettes in Quaternary dune fields. Massive brown clay soils, bare surfaces. Pans and swamps of deep, widely cracking self-mulching grey and brown clays with canegrass (*Eragrostis australasica*) and lignum (*Muehlenbeckia cunninghamii*) in centres and black bluebush (*Maireana pyramidata*) on margins. Isolated mulga (*Acacia aneura*) on lunettes.

Mwn Mootwingee - Wonaminta Linear Dunes BHC Mootwingee
Mootwingee-Wonaminta Linear Dunes ecosystem includes parts of two land systems: *Copago* and *Gumpopla.*

Quaternary dune fields with east-west trending dunes, broad swales and small drainage lines, sinks and swamps, relief to 5m, and widely spaced parallel dunes with alluvial corridors and pans, relief to 10m. Calcareous red earths, solonized brown soils, red sands and red sandy earths.

Scattered to moderate mulga (*Acacia aneura*), belah (*Casuarina cristata*) and rosewood (*Alectryon oleifolium*); clumped narrow-leaf hopbush (*Dodonaea attenuata*) and punty bush (*Senna eremophila*); speargrass (*Austrostipa variabilis*), cannon-ball (*Sclerolaena paradoxa*), copperburr (*Sclerolaena* sp.) and forbs. Bimble box *(Eucalyptus populnea*) and black box *(Eucalyptus largiflorens*) including hybrids with turpentine (*Eremophila sturtii*), prickly wattle (*Acacia victoriae*), canegrass (*Eragrostis australasica*), annual saltbush (*Atriplex muelleri*) and bluebush (*Maireana* sp.) in swamps and sinks. Bare scalded alluvial flats with sandy red earths and texture-contrast soils and open mulga and shrubs. Crusty brown clays in pans with canegrass, black bluebush (*Maireana pyramidata*) and fringing black box.

Mwr Mootwingee - Wonaminta Ranges BHC Mootwingee
Mootwingee-Wonaminta Ranges ecosystem includes parts of four land systems: *Bynguano, Faraway, Kayrunnera* and *Wonaminta.*

Closely dissected rounded ridges of pre-Cambrian schist, slate and phyllite, gently dipping Devonian sandstone and conglomerate ranges with steep cliff faces and more gentle back slopes and narrow valleys, relief to 150m. Flattish-crested hills on basic dykes in phyllite of Pre-Cambrian age, relief to 15m. Rock outcrop, boulders and lithosols on crests with pockets of reddish-brown calcareous sandy loam. Slopes with lithosols and brownish calcareous loams, contour banded slopes; bare stony areas alternate with calcareous red earths. Sandy red earths and texture-contrast soils in valleys.
Crests and rocky areas support sparse mulga (*Acacia aneura*), umbrella mulga (*Acacia brachystachya*), white cypress pine (*Callitris glaucophylla*), western red box *(Eucalyptus intertexta*), fuchsia bush (*Eremophila* sp.), dead-finish (*Acacia tetragonophylla*), caustic vine (*Sarcostemma australe*), pearl bluebush (*Maireana sedifolia*), rock fern (*Cheilanthes tenuifolia*) and rock isotome (*Isotoma petraea*). Rounded low hills with curly mallee *(Eucalyptus gillii*), belah (*Casuarina cristata*), and black bluebush (*Maireana pyramidata*). Slopes with beefwood (*Grevillea striata*), prickly wattle (*Acacia victoriae*), broad-leaf

hopbush (*Dodonaea viscosa*), turpentine (*Eremophila sturtii*), short grasses and forbs. Contour banded slopes; bare stony areas alternate with bladder saltbush (*Atriplex vesicaria*) and black bluebush. Drainage tracts carry black bluebush, bladder saltbush, belah and western boobialla (*Myoporum montanum*) on minor channels, and river red gum *(Eucalyptus camaldulensis*) on larger channels.

Mwp Mootwingee - Wonaminta Salt Lakes and Playas BHC Mootwingee
Mootwingee-Wonaminta Salt Lakes and Playas ecosystem is made up of part of the *Cobham* land system.

Widely distributed shallow saline lakes and clay playas of Quaternary age with bare, flat, crusted floors of salty grey and brown clay. Pans with deep self-mulching brown cracking clays and brown clays with strong surface crusts, canegrass (*Eragrostis australasica*) and lignum (*Muehlenbeckia cunninghamii*) in centres with chenopods and prickly wattle (*Acacia victoriae*) along margins. Swamp basins and channels with deep self-mulching brown and grey cracking clays, some with extremely deep and wide cracks. Shrubs and canegrass with fringing black box *(Eucalyptus largiflorens*) on pan margins with sandy surfaces over earthy pans. Lunettes to 10m, of deep, brown clayey sand with open mulga (*Acacia aneura*), turpentine (*Eremophila sturtii*), pearl bluebush (*Maireana sedifolia*) and forbs and grasses.

Mws Mootwingee - Wonaminta Sandplains BHC Mootwingee
Mootwingee-Wonaminta Sandplains ecosystem includes parts of five land systems: *Duntroon, Mutapa, Nucha, Rodges* and *Vidale.*

Slightly undulating Quaternary sandplain with small flats, drainage lines and depressions, relief to 5m. Patches of east-west trending dunes with broad to narrow swales and many small rounded depressions, relief to 7m. Calcareous red earths, some reddish texture-contrast soils on plains, red sands and sandy earths on dunes, solonized brown soils in swales and sinks.

Sandplains with moderate to sparse mulga (*Acacia aneura*), belah (*Casuarina cristata*), rosewood (*Alectryon oleifolium*), leopardwood (*Flindersia maculosa*), moderate to dense prickly wattle (*Acacia victoriae*), boobialla (*Myoporum montanum*), narrow-leaf hopbush (*Dodonaea attenuata*), punty bush (*Senna eremophila*), emu bush (*Eremophila longifolia*), variable speargrass (*Austrostipa variabilis*), copperburr (*Sclerolaena* sp.), cannonball burr (*Sclerolaena paradoxa*) and other grasses and forbs. Dunes with sparse to moderate belah, rosewood, mulga, needlewood (*Hakea leucoptera*), narrow-leaf hopbush, turpentine (*Eremophila sturtii*), and scattered black bluebush (*Maireana pyramidata*) with grasses. Black box *(Eucalyptus largiflorens*), bimble box *(Eucalyptus populnea*), lignum (*Muehlenbeckia cunninghamii*), canegrass (*Eragrostis australasica*), and neverfail (*Eragrostis setifolia*) in drainage lines and sinks.

Mwt Mootwingee - Wonaminta Tablelands BHC Mootwingee
Mootwingee-Wonaminta Tablelands ecosystem includes parts of four land systems: *Flat Top, Kara Hill, Pulgamurtie* and *Ravendale.*

Plateau with escarpments on horizontal Devonian sandstone, dissected rolling stony tablelands on Cretaceous claystone and sandstone with breakaways, isolated boulder strewn silcrete capped mesas, discontinuous rocky cliffs and surrounding plains, relief 40 to 80m. Plateau with yellowish-red lithosols. Slopes with brown loamy lithosols, red desert loams with red clays in gilgai depressions grade to deep neutral reddish-brown sands and loams in drainage tracts.

Plateau and mesa tops essentially treeless except for occasional patches of mulga (*Acacia aneura*) or gidgee (*Acacia cambagei*). Stunted mulga, white cypress pine (*Callitris glaucophylla*) and cabbage-tree wattle (*Acacia cana*) at the breakaway. Slopes with bladder

saltbush (*Atriplex vesicaria*), black bluebush (*Maireana pyramidata*), pearl bluebush (*Maireana sedifolia*) and some mulga. River red gum *(Eucalyptus camaldulensis*) along larger creek banks.

Meso: BHC Scropes

Sra Scropes Alluvial Plains BHC Scropes

Scropes Alluvial Plains ecosystem is made up of part of the *Fowlers* land system.

Narrow floodplains, channels with levees and moderately scalded back plains. Sandy loam reddish-brown surfaced texture-contrast soils, brown clays with strong surface crusts with fine sand and silt. Sand in creek beds.

Prickly wattle (*Acacia victoriae*), and river red gum *(Eucalyptus camaldulensis*) in upper reaches, scattered bladder saltbush (*Atriplex vesicaria*) with grasses and forbs downstream.

Srd Scropes Downs BHC Scropes

Scropes Downs ecosystem includes parts of four land systems: *Cymbric, Euramurtie, Nuntherungie* and *Oakvale.*

Undulating stony plains and lowlands with contour bands and sand-covered footslopes on pre-Cambrian quartzite, dolomite and calcareous shale, with dense incised drainage, relief to 30m. Shallow stony reddish-brown calcareous sandy loams, deeper and better developed along drainage tracts. Footslopes of red desert loams and contour bands of stone-free red clays alternating with bare stony red desert loams.

Black bluebush (*Maireana pyramidata*), bladder saltbush (*Atriplex vesicaria*), with local clumps of moderately dense belah (*Casuarina cristata*), and mulga (*Acacia aneura*). Scattered to moderate leopardwood (*Flindersia maculosa*), rosewood (*Alectryon oleifolium*), narrow-leaf hopbush (*Dodonaea attenuata*), dead finish (*Acacia tetragonophylla*), with dense cabbage-tree wattle (*Acacia cana*), pearl bluebush (*Maireana sedifolia*), kerosene grass (*Aristida contorta*), wiregrass (*Aristida* sp.), woollybutt (*Eragrostis eriopoda*), copperburr (*Sclerolaena* sp.) and forbs. Drainage tracts with western boobialla (*Myoporum montanum*), saltbush (*Atriplex* sp.) and black bluebush on minor streams. River red gum *(Eucalyptus camaldulensis*) and kangaroo grass (*Themeda triandra*) on major streams.

Srl Scropes Linear Dunes BHC Scropes

Scropes Linear Dunes is made up of part of the *Copago* land system.

Quaternary dune field with east-west trending dunes, broad swales and small drainage lines, sinks and swamps, relief to 5m. Calcareous red earths, solonized brown soils, red sands and red sandy earths; scattered to moderate mulga (*Acacia aneura*), belah (*Casuarina cristata*) and rosewood (*Alectryon oleifolium*); clumped narrow-leaf hopbush (*Dodonaea attenuata*) and punty bush (*Senna eremophila*); variable speargrass (*Austrostipa variabilis*), cannon-ball (*Sclerolaena paradoxa*), copperburr (*Sclerolaena* sp.) and forbs. Bimble box *(Eucalyptus populnea*) and black box *(Eucalyptus largiflorens*) including hybrids with turpentine (*Eremophila sturtii*), prickly wattle (*Acacia victoriae*), canegrass (*Eragrostis australasica*), annual saltbush (*Atriplex muelleri*) and bluebush (*Maireana* sp.) in swamps and sinks.

Srg Scropes Ranges BHC Scropes

Scropes Ranges ecosystem is made up of part of the *Scopes* land system.

Rounded rocky ridges and lower hills of partly silicified lower Ordovician sandstone, quartzite and conglomerate, partially overlain by Quaternary aeolian material, relief to 70m.

Shallow, stony sandy soils, grading to calcareous red earths and stony red desert loams, calcareous red earths and red texture-contrast soils in valleys.

Moderate to scattered mulga (*Acacia aneura*) and belah (*Casuarina cristata*), scattered to locally dense jockey's cap (*Prostanthera striatiflora*), thorny saltbush (*Rhagodia spinescens*), dead finish (*Acacia tetragonophylla*), green fuchsia bush (*Eremophila serrulata*) and other shrubs. Dense clumps of black bluebush (*Maireana pyramidata*) and low-bluebush (*Maireana astrotricha*) on upper slopes. Lower slopes partly contour banded with stony red desert loams with belah, mulga, short-winged copperburr (*Sclerolaena brachyptera*), grey poverty bush (*Sclerolaena* sp.), variable speargrass (*Austrostipa variabilis*), and bottlewashers (*Enneapogon* sp.). River red gum *(Eucalyptus camaldulensis*) along main channels.

Sry Scropes Salt Lakes and Playas BHC Scropes

Scropes Salt Lakes and Playas ecosystem is made up of part of the *Birdwood* land system.

Small, shallow relict lakes and lunettes of Quaternary age with extensive associated sandplains and isolated dunes. Lake floors of highly saline, gypseous or calcareous grey clays with chenopods, canegrass (*Eragrostis australasica*) and forbs. Lunettes and dunes of deep sandy red earths with mallee *(Eucalyptus* sp.) and porcupine grass (*Triodia irritans*). Sandplain of scalded to sandy solonized brown soils with belah (*Casuarina cristata*), rosewood (*Alectryon oleifolium*), sugarwood (*Myoporum platycarpum*) and mallee plus abundant grasses and forbs.

Srs Scropes Sandplains BHC Scropes

Scropes Sandplains ecosystem includes parts of six land systems: *Duntroon, Haythorpe, Kars, Mutapa, Nelia* and *Nucha.*

Slightly undulating Quaternary sandplain with small flats, drainage lines and depressions. Areas of east-west trending dunes and irregular rises often associated with large lakes. Broad swales, relief 3 to 10m. Sandy red earths and calcareous red earths, red texture-contrast soils and brown clays in depressions.

Moderate to sparse mulga (*Acacia aneura*), belah (*Casuarina cristata*), scattered to dense black bluebush (*Maireana pyramidata*), leopardwood (*Flindersia maculosa*), prickly wattle (*Acacia victoriae*), boobialla (*Myoporum montanum*), narrow-leaf hopbush (*Dodonaea attenuata*), punty bush (*Senna eremophila*), emu bush (*Eremophila longifolia*), variable speargrass (*Austrostipa variabilis*), copperburr (*Sclerolaena* sp.), cannonball burr (*Sclerolaena paradoxa*) and other grasses and forbs. Bimble box *(Eucalyptus populnea*), black box *(Eucalyptus largiflorens*), lignum (*Muehlenbeckia cunninghamii*) and dense canegrass (*Eragrostis australasica*) in sinks.

CHC - Descriptions for Landscapes in the Channel Country Bioregion

Meso: CHC Bulloo

Blc Bulloo Channels and Floodouts CHC Bulloo

Bulloo Channels and Floodouts ecosystem is made up of part of the *Bullagree* land system.

Extensive Quaternary floodout pans of the Bulloo overflow; compact saline grey clays with canegrass (*Eragrostis australasica*), lignum (*Muehlenbeckia cunninghamii*) and ephemerals.

Brown sand hummocks with lignum and old man saltbush (*Atriplex nummularia*) over short grass and ephemerals, patches of black box *(Eucalyptus largiflorens*) on sandy banks.

Bld Bulloo Linear Dunes CHC Bulloo

Bulloo Linear Dunes ecosystem includes parts of two land systems: *Gumpopla* and *Marrapina.*

Widely spaced parallel and partly aligned dunes of Quaternary age with alluvial corridors and pans, relief to 10m. Deep red and yellow clayey sand with narrow flat swales of sandy red earths overlying earthy pans.

Sparse mulga (*Acacia aneura*), dense white cypress pine (*Callitris glaucophylla*), whitewood (*Atalaya hemiglauca*), old man saltbush (*Atriplex nummularia*), forbs and grasses on dunes. Bare scalded alluvial flats with sandy red earths and texture-contrast soils with open mulga and shrubs. Crusty brown clays in pans with canegrass (*Eragrostis australasica*), black bluebush (*Maireana pyramidata*), and fringing black box *(Eucalyptus largiflorens*).

Bll Bulloo Littoral and Lunettes CHC Bulloo

Bulloo Littoral and Lunettes ecosystem includes parts of two land systems: *Teurika* and *Tongowoko.*

Sandy littoral zone, delta fans, remnant lunettes and associated pans, and dunes of Quaternary age in the Bulloo overflow, relief to 15m. The sandy littoral zone consists of loose white to reddish-yellow sands with abundant pedestalled canegrass (*Eragrostis australasica*) and sparse forbs and grasses, bare scalded areas with saline layered silty sediments. Isolated depressions of self-mulching grey clay with extremely deep and wide cracks and canegrass.

The elongated sand hills are of loose pale sand and loamy sand, severely scalded with sparse mulga (*Acacia aneura*), Sturt's pigface (*Aizoon quadrifidum*), turpentine (*Eremophila sturtii*) and grasses. Pans and swamp with deep, self mulching brown and grey cracking clays with canegrass, old man saltbush (*Atriplex nummularia*) and grasses. Sandplain with deep reddish-yellow clayey sand with sparse mulga, whitewood (*Atalaya hemigluaca*) and grasses.

Blp Bulloo Salt Lakes and Playas CHC Bulloo

Bulloo Salt Lakes and Playas ecosystem is made up of part of the *Cobham* land system.

Widely distributed saline lakes and clay playas of Quaternary age with bare, flat, crusted floors of salty grey and brown clay. Pans with deep self-mulching brown cracking clays and brown clays with strong surface crusts, canegrass (*Eragrostis australasica*) and lignum (*Muehlenbeckia cunninghamii*) in centres with chenopods and prickly wattle (*Acacia victoriae*) along margins. Swamp basins and channels with deep self-mulching brown and grey cracking clays, some with extremely deep and wide cracks.

Shrubs and canegrass with fringing black box *(Eucalyptus largiflorens*) on pan margins with sandy surfaces over earthy pans. Lunettes up to 10m relief of deep, brown clayey sand with open mulga (*Acacia aneura*), turpentine (*Eremophila sturtii*), pearl bluebush (*Maireana sedifolia*) and forbs and grasses.

Bla Bulloo Sandplains CHC Bulloo

Sandplains ecosystem is made up of part of the *Nucha* land system.

Slightly undulating plains of Quaternary aeolian sand and alluvium with small pans, relief to 5m. Sandy calcareous red earths, earthy pans at depth with scattered mulga (*Acacia aneura*), rosewood (*Alectryon oleifolium*) and abundant grasses. Small depressions with sandy red

earths, calcareous at shallow depths, locally with lime exposed. Pans of brown and grey cracking clay with perennial grasses and fringing black box *(Eucalyptus largiflorens*).

Meso: CHC Tibooburra

Tba Tibooburra Alluvial Plains CHC Tibooburra

Tibooburra Alluvial Plains ecosystem includes parts of seven land systems: *Allandy, Caloola, Conservation, Fowler, Gum Vale, Narriarra* and *Sturt.*

Extensively scalded alluvial plains, narrow floodplains, channels with levees and moderately scalded back plains of Quaternary alluvium. Terminal floodplains with anastomosing channels, pans and extensive gilgai, scattered low dunes. Relief to 8m. Reddish-brown sandy and loamy, hard-setting texture-contrast soils often with loose sand cover across plains. Brown clays with strong surface crusts, deep self-mulching brown and grey cracking clays saline calcareous and gypseous at variable depths in pans and floodouts. Levees with deep fine sand and silt. Red clayey sand in dunes, sand in creek beds, sandy hummocks around shrubs.

Sparse mulga (*Acacia aneura*), whitewood (*Atalaya hemigluaca*), prickly wattle (*Acacia victoriae*), punty bush (*Senna eremophila*), bushy groundsel (*Senecio cunninghamii*), thorny saltbush (*Rhagodia* sp*inescens*), extensive Mitchell grass (*Astrebla* sp.) on plains. Prickly wattle, bladder saltbush (*Atriplex vesicaria*), thorny saltbush in floodouts. Canegrass (*Eragrostis australasica*) and fringing black box *(Eucalyptus largiflorens*) on pans, river red gum *(Eucalyptus camaldulensis*) and coolibah *(Eucalyptus microtheca*) with some gidgee (*Acacia cambagei*) along major creeks.

Tbd Tibooburra Downs CHC Tibooburra

Tibooburra Downs ecosystem includes parts of eight land systems: *Bancannia, Katalpa, Nundora, Nuntherungie, Oakvale, Olive Downs, Onepah* and *Pulchra.*

Stony alluvial plains of Quaternary age, relief to 3m. Contour banded stony red desert loams and self-mulching clays in depressions. Dunes of deep clayey sand. Stony reddish-brown calcareous sandy loams, along drainage tracts, alluvial flats with brown self-mulching cracking clays. Contour banded undulating treeless plain; relief to 15m. Bare stony rises of brown desert loams and stone-free deep brown clays with Mitchell grass (*Astrebla* sp.) and bladder saltbush (*Atriplex vesicaria*). Areas of highly gypseous yellowish-brown calcareous loams and clay loams with frequent mudstone rock outcrop and sparse perennial grasses and forbs. Alluvial flats with brown self-mulching cracking clays.

Slopes with isolated mulga (*Acacia aneura*) and needlewood (*Hakea leucoptera*) with scattered shrubs; local stands of dense low bluebush (*Maireana astrotricha*), contour banded bladder saltbush (*Atriplex vesicaria*), cabbage-tree wattle (*Acacia cana*), belah (*Casuarina cristata*), and pearl bluebush (*Maireana sedifolia*), with local clumps of moderately dense belah, and mulga, abundant bottlewashers (*Enneapogon* sp.) and copperburr (*Sclerolaena* sp.). Flats with copperburr, thorny saltbush (*Rhagodia* sp*inescens*) and Mitchell grass. Drainage lines with prickly wattle (*Acacia victoriae*), western boobialla (*Myoporum montanum*), sandalwood (*Santalum lanceolatum*), rosewood (*Alectryon oleifolium*), belah, white cypress pine (*Callitris glaucophylla*) and black box *(Eucalyptus largiflorens*). River red gum *(Eucalyptus camaldulensis*) along larger streams.

Tbf Tibooburra Fresh Lakes and Swamps CHC Tibooburra

Tibooburra Fresh Lakes and Swamps ecosystem is made up of part of the *Fort Grey* land system.

Small lakes with low lunettes in dune fields. Alluvial, lacustrine and aeolian sediments of Quaternary age. Massive brown clay soils, bare surfaces. Pans and swamps of deep, widely cracking self-mulching grey and brown clays with canegrass (*Eragrostis australasica*) and lignum (*Muehlenbeckia cunninghamii*) in centres and black bluebush (*Maireana pyramidata*), on margins. Isolated mulga (*Acacia aneura*) on lunettes.

Tbr Tibooburra Ranges CHC Tibooburra

Tibooburra Ranges ecosystem includes parts of five land systems: *Black Stump, Faraway, Mount Arrowsmith, Tibooburra* and *Wonaminta.*

Steep, partly bevelled ridges and slopes on pre-Cambrian to Ordovician quartzite, sandstone, slate, phyllite, and basic volcanic rocks. Trellis drainage pattern, relief to 150m. Massive rounded granite hills with tors, up to 25m relief. Dissected uplands on Cretaceous sandstone and conglomerate with long, gently undulating slopes on mudstones, relief to 20m. Rocky crests and upper slopes with little soil. Scalded, stone strewn areas of brown desert loam, reddish, loamy sand lithosols, locally calcareous, becoming redder and better developed down slope. Long lower slopes with red earths and texture-contrast soils with calcareous subsoils overlying hardpans or sandstone. Yellowish-red gritty neutral sandy loam lithosols on granite. Gravelly alluvium with reddish-brown texture-contrast soils in drainage tracts.

Rocky crests with scattered mulga (*Acacia aneura*), cabbage-tree wattle (*Acacia cana*), dead finish (*Acacia tetragonophylla*), pearl bluebush (*Maireana sedifolia*), and bladder saltbush (*Atriplex vesicaria*). Slopes with desert poplar (*Codonocarpus cotinifolius*), belah (*Casuarina cristata*), rosewood (*Alectryon oleifolium*), mulga, gidgee (*Acacia cambagei*) and abundant chenopods. Sparse sandalwood (*Santalum lanceolatum*), bladder saltbush, and grasses on granite slopes. Curly mallee *(Eucalyptus gillii*), belah, and black bluebush (*Maireana pyramidata*), on calcareous rocks. Desert paper-bark (*Melaleuca glomerata*), prickly wattle (*Acacia victoriae*), thorny saltbush (*Rhagodia* sp*inescens*), coolibah *(Eucalyptus microtheca*) and river red gum *(Eucalyptus camaldulensis*) on larger channels.

Tbp Tibooburra Salt Lakes and Playas CHC Tibooburra

Tibooburra Salt Lakes and Playas ecosystem is made up of part of the *Cobham* land system.

Widely distributed saline lakes and clay playas of Quaternary age with bare, flat, crusted floors of salty grey and brown clay. Pans with deep self-mulching brown cracking clays and brown clays with strong surface crusts, canegrass (*Eragrostis australasica*) and lignum (*Muehlenbeckia cunninghamii*) in centres with chenopods, and prickly wattle (*Acacia victoriae*) along margins. Swamp basins and channels with deep self-mulching brown and grey cracking clays, some with extremely deep and wide cracks.

Shrubs and canegrass with fringing black box *(Eucalyptus largiflorens*) on pan margins with sandy surfaces over earthy pans. Lunettes up to 10m, of deep, brown clayey sand with open mulga (*Acacia aneura*), turpentine (*Eremophila sturtii*), pearl bluebush (*Maireana sedifolia*) and forbs and grasses.

Tbs Tibooburra Sandplains CHC Tibooburra

Tibooburra Sandplains ecosystem includes parts of two land systems: *Nucha* and *Rodges.*

Slightly undulating sandplains and alluvial plains of Quaternary age with small pans, relief to 5m. Sandy calcareous red earths, earthy pans at depth with scattered mulga (*Acacia aneura*), rosewood (*Alectryon oleifolium*) and abundant grasses. Small depressions with sandy red earths, calcareous at shallow depths, locally with lime exposed. Pans of brown and grey cracking clay with perennial grasses and fringing black box *(Eucalyptus largiflorens*). Brown clays with strong surface crusts on alluvial plains with belah (*Casuarina cristata*), cabbage-

tree wattle (*Acacia cana*), leopardwood (*Flindersia maculosa*), turpentine (*Eremophila sturtii*) and grasses.

Tbt Tibooburra Tablelands CHC Tibooburra

Tibooburra Tablelands ecosystem includes parts of three land systems: *Flat Top, Quarry View* and *Pulgamurtie.*

Stony tablelands on Cretaceous sandstones and isolated silcrete capped mesas and surrounding plains, relief to 80m. Also, dissected rolling stony tablelands on Cretaceous sandstone and mudstone with breakaways, relief to 40m. Boulder strewn mesa tops essentially treeless, discontinuous rocky cliffs at the breakaway over slopes with brown loamy lithosols and sparse vegetation.

Footslopes with stony mantles, red and brown desert loams supporting bladder saltbush (*Atriplex vesicaria*), black bluebush (*Maireana pyramidata*), thorny saltbush (*Rhagodia spinescens*) and grasses. Red desert loams with red clays in gilgai depressions grade to deep neutral reddish-brown sands and loams in drainage tracts.

Shrublands, mainly of bladder saltbush, with pearl bluebush (*Maireana sedifolia*) on slopes and some mulga (*Acacia aneura*), gidgee (*Acacia cambagei*) and western bloodwood (*Corymbia terminalis*) on hills. Scarps with brown loamy lithosols, bouldery mantles with scattered mulga, bastard mulga (*Acacia clivicola*) and rock fuchsia bush (*Eremophila freelingii*). Gidgee patches on lower slopes.

CP - Descriptions for Landscapes in the Cobar Peneplain Bioregion

Meso: CP Barnato

Bdn Barnato Downs CP Barnato

Barnato Downs ecosystem includes parts of six land systems: *Boulkra, Cottage, Ironstone, Lilyvale, Taringa* and *Wilsons Tank.*

Undulating rounded Devonian quartzite and sandstone ridges with small plateau, footslopes, and narrow and broad drainage flats, relief to 10m, occasionally to 20m. Includes areas of Tertiary silcrete ridges with long low slopes and broad level plains, relief to 20m. Some ridges are partly covered by aeolian sand. Shallow, stony, loamy and sandy soils on crests. Ferruginous red earths on lower slopes and in drainage lines. Deep, calcareous red earths and solonized brown soils with gilgai on plateau. Red earths and red texture-contrast soils on lower slopes, passing to deeper clays with gilgai, texture-contrast soils and solonized brown soils on lower slopes and in drainage lines.

Moderate to scattered mulga (*Acacia aneura*), rosewood (*Alectryon oleifolium*), turpentine (*Eremophila sturtii*), ironwood (*Acacia excelsa*), silver cassia (*Senna artemisioides*), western red box *(Eucalyptus intertexta*), leopardwood (*Flindersia maculosa*), narrow-leaf hopbush (*Dodonaea viscosa*), warrior bush (*Apophyllum anomalum*), and rare brigalow (*Acacia harpophylla*) on crests and slopes. Mulga, red box, white cypress pine (*Callitris glaucophylla*), yarran (*Acacia homalophylla*), budda (*Eremophila mitchellii*) and emu bush (*Eremophila longifolia*) on slopes. Bimble box *(Eucalyptus populnea*), wilga (*Geijera parviflora*), white cypress pine, some mulga, yarran and abundant grasses including kangaroo grass (*Themeda triandra*) in drainage lines.

Bis Barnato Incised Streams CP Barnato

Barnato Incised Streams ecosystem includes parts of three land systems: *Kaleno, Wrightville* and *Yanda.*

Major drainage lines with Quaternary alluvium draining north off the Cobar Peneplain. Partly scalded plains with few small drainage sinks, floodplains with stable incised and slightly sinuous channels, slightly terraced tributary drainage lines, small stony or sandy rises, relief to 3m. Reddish texture-contrast soils and red earths on plains, often gravely with some hardpan development. Sandy soils on rises and in creek channel.

Dense ironwood (*Acacia excelsa*), white cypress pine (*Callitris glaucophylla*), belah (*Casuarina cristata*), scattered bimble box *(Eucalyptus populnea*), mulga (*Acacia aneura*), and rosewood (*Alectryon oleifolium*), with dense turpentine (*Eremophila sturtii*) and narrow-leaf hopbush (*Dodonaea viscosa*) and grasses on the plains. Dense bimble box and white cypress pine in drainage sinks, river red gum *(Eucalyptus camaldulensis*), budda (*Eremophila mitchellii*), lignum (*Muehlenbeckia cunninghamii*), rushes and grasses along creek channels. Ironwood (*Acacia excelsa*) and mulga on stony rises.

Bih Barnato Isolated Hills CP Barnato

Barnato Isolated Hills ecosystem includes parts of two land systems: *Booroondarra* and *Mulga Downs*.

Low, bevelled and rounded strike ridges rocky cliffs and footslopes of Devonian quartzite, sandstone and conglomerate and with narrow alluvial valleys, relief to 200m. Shallow, stony sandy lithosols becoming deeper and better developed down slope, narrow valleys of red earths, incised drainage tracts with bare rock or sandy beds and levees.

Moderate to dense mallee *(Eucalyptus* sp.), currawang (*Acacia doratoxylon*), white cypress pine (*Callitris glaucophylla*), western red box *(Eucalyptus intertexta*), mulga (*Acacia aneura*) and green fuchsia bush (*Eremophila serrulata*) on upper slopes and scarps; abundant mulga, moderate silver cassia (*Senna artemisioides*), narrow-leaf wax flower (*Eriostemon linearis*) and other shrubs with long greybeard grass (*Amphipogon caricinus*), wire grass (*Aristida* sp.), and purple love grass (*Eragrostis lacunaria*) on lower slopes. White cypress pine and bimble box *(Eucalyptus populnea*) along creeks. Dense red mallee *(Eucalyptus socialis*) with porcupine grass (*Triodia irritans*) on sand accumulations.

Blk Barnato Lakes CP Barnato

Barnato Lakes includes parts of part of two land systems: *Barnato* and *Tiltagara.*

Level plains with shallow lakes with in-flowing creeks, lunettes, channels and low stony rises in Quaternary alluvium, relief 3 to 10m. Beds of heavy clay soils with fairy grass when dry. Shallow sandy surface deposit, around shorelines, with dense bimble box *(Eucalyptus populnea*), canegrass (*Eragrostis australasica*), rushes and neverfail (*Eragrostis setifolia*). Lunettes of shallow to deep solonized brown soils over calcrete with belah (*Casuarina cristata*), mallee *(Eucalyptus* sp.), bimble box, rosewood (*Alectryon oleifolium*), narrow-leaf hopbush (*Dodonaea viscosa*), warrior bush (*Apophyllum anomalum*), twin-leaf (*Zygophyllum apiculatum*), and variable spear grasses (*Austrostipa variabilis*). Inflowing channels of clay soils or calcareous red earths with dense bimble box. Calcareous red earths and red texture-contrast soils with gravel lag on rises and plains with scattered belah (*Casuarina cristata*) yarran (*Acacia homalophylla*), bimble box, wilga (*Geijera parviflora*), white cypress pine (*Callitris glaucophylla*), warrior bush, windmill grass (*Chloris truncata*), copperburr (*Sclerolaena* sp.) and forbs.

Bln Barnato Linear Dunes CP Barnato

Barnato Linear Dunes ecosystem includes parts of two land systems: *Blackfella* and *Lachlan Downs.*

Low sloping sandplains of Quaternary sediment with small drainage sinks and some low linear dunes with relief to 3m. This abuts and partly overlies ranges and hills, relief to 20m. Deep red sandy earths, calcareous red earths and sands with dense mallee *(Eucalyptus* sp.), broombush (*Melaleuca uncinata*), western red box *(Eucalyptus intertexta*), narrow-leaf hopbush (*Dodonaea viscosa*), porcupine grass (*Triodia irritans*), paper daisy (*Helichrysum* sp.), and sparse forbs and perennial short grasses. Solonized brown soils, calcareous red earths and non-cracking clays on plains and isolated sinks with black box *(Eucalyptus largiflorens*), bimble box *(Eucalyptus populnea*), lignum (*Muehlenbeckia cunninghammii*), New Zealand spinach (*Tetragonia tetragonioides*), turpentine (*Eremophila sturtii*), emu bush (*Eremophila longifolia*) and neverfail (*Eragrostis setifolia*).
.

Bpa Barnato Plains CP Barnato
Barnato Plains ecosystem includes parts of two land systems: *Coronga* and *Korreo.*

Colluvial and alluvial rolling sandy plains of Quaternary sediments on western sides of hills and ranges on Devonian bedrock, relief to 15m. Low stony rises and poorly defined drainage lines, relief to 2m. Moderately deep to deep neutral red earths with hardpan and gravel; dense to moderate mulga (*Acacia aneura*), western red box *(Eucalyptus intertexta*), ironwood (*Acacia excelsa*), white cypress pine (*Callitris glaucophylla*), punty bush (*Senna eremophila*), turpentine (*Eremophila sturtii*), budda (*Eremophila mitchellii*), wire grass (*Aristida* sp.), variable spear grass (*Austrostipa variabilis*), kerosene grass (*Aristida contorta*) on plains and rises. Bimble box *(Eucalyptus populnea*), turpentine, ironwood (*Acacia excelsa*) and grasses in drainage lines. Loamy colluvial soils and calcareous red earths on plains, deep red siliceous sands on dunes, texture-contrast soils in valleys. White cypress pine and sandhill wattle (*Acacia ligulata*) on dunes.

Bwv Barnato Wide Valleys CP Barnato
Barnato Wide Valleys ecosystem includes parts of three land systems: *Cubba, Meadows* and *Mulchara.*

Terraced broad plains with drainage lines of major and minor narrow stable channels. Isolated sand dunes and sandy rises, relief to 3m. Deep red earths, calcareous red earths and poorly structured texture-contrast soils on plains, with texture-contrast soils on lower terraces and non-cracking clays in some channels. Sands on dunes and creek levees.

Scattered to moderate white cypress pine (*Callitris glaucophylla*) and ironwood (*Acacia excelsa*), with dense clumps of turpentine (*Eremophila sturtii*) and narrow-leaf hopbush (*Dodonaea viscosa*) on plains. Scattered bimble box *(Eucalyptus populnea*), white cypress pine, mulga (*Acacia aneura*), ironwood, and dense to moderate budda (*Eremophila mitchellii*), turpentine and narrow-leaf hopbush on terraces. Dense bimble box in drainage sinks, river red gum *(Eucalyptus camaldulensis*) and bimble box along creek channels, perennial short grasses and forbs throughout.

Brg Belarabon Range CP Barnato
Belarabon Range ecosystem includes parts of two land systems: *Booroondarra* and *Mulga Downs.*

Low bevelled and rounded strike ridges and footslopes, rocky cliffs of Devonian quartzite, sandstone, conglomerate and shale with narrow alluvial valleys, relief to 200m. Shallow, sandy lithosols becoming deeper and better developed down slope, narrow valleys of red earths, incised drainage tracts with bare rock or sandy creek beds and levees.

Moderate to dense mallee *(Eucalyptus* sp.), currawang (*Acacia doratoxylon*), white cypress pine (*Callitris glaucophylla*), western red box *(Eucalyptus intertexta*), mulga (*Acacia aneura*) and green fuchsia bush (*Eremophila serrulata*) on upper slopes and scarps; abundant mulga, moderate silver cassia (*Senna artemisioides*), narrow-leaf wax flower (*Eriostemon linearis*) and other shrubs with long greybeard grass (*Amphipogon caricinus*), wire grass (*Aristida* sp.), and purple love grass (*Eragrostis lacunaria*) on lower slopes. White cypress pine and bimble box *(Eucalyptus populnea*) along creeks. Dense red mallee *(Eucalyptus socialis*) with porcupine grass (*Triodia irritans*) on sand accumulations.

Mma Marma Hills CP Barnato

Marma Hills ecosystem includes parts of two land systems: *Booroondarra* and *Mulga Downs.*

Low bevelled and rounded strike ridges, rocky cliffs and footslopes of Devonian quartzite, sandstone, conglomerate and shale with narrow alluvial valleys, relief to 200m. Shallow, sandy lithosols becoming deeper and better developed down slope, narrow valleys of red earths, incised drainage tracts with bare rock or sandy creek beds and levees.

Moderate to dense mallee *(Eucalyptus* sp.), currawang (*Acacia doratoxylon*), white cypress pine (*Callitris glaucophylla*), western red box *(Eucalyptus intertexta*), mulga (*Acacia aneura*) and green fuchsia bush (*Eremophila serrulata*) on upper slopes and scarps; abundant mulga, moderate silver cassia (*Senna artemisioides*), narrow-leaf wax flower (*Eriostemon linearis*) and other shrubs with long greybeard grass (*Amphipogon caricinus*), wire grass (*Aristida* sp.), and purple love grass (*Eragrostis lacunaria*) on lower slopes. White cypress pine and bimble box along creeks *(Eucalyptus populnea*). Dense red mallee *(Eucalyptus socialis*) with porcupine grass (*Triodia irritans*) on sand accumulations.

Gcx Mt Grenfell Ridges CP Barnato

Mt Grenfell Ridges landscape includes parts of eight land systems: *Booroondarra, Coronga, Euramurtie, Ironstone, Lilyvale, Lynwood, Mulga Downs* and *Wilsons Tank.*

Bevelled and rounded Devonian quartzite, sandstone and conglomerate strike ridges, rocky cliffs, colluvial slopes, narrow to broad drainage lines, relief 30 to 180m. Associated colluvial and alluvial plains, low stony rises, sand-covered footslopes and sandplains, outwash plain on the edge of ranges, with a few low dunes, creek channels and terminal drainage sinks, relief 5 to 20m. Rocky upper slopes and ridges, sandy lithosols becoming deeper and better developed down slope, narrow valleys of red earths, incised drainage tracts with bare rock or sandy creek beds and levees. Moderately deep to deep neutral red earths with hardpan and gravel on lower colluvial slopes. Shallow stony ferruginous clay loam soils on low crests and upper slopes, with ferruginous red earths on lower slopes and in drainage lines. Footslopes of red desert loams with mantles of silcrete boulders, outwash plains with calcareous red earths with sandy surface, sands in channels and on dunes.

Upper slopes and scarps carry moderate to dense grey mallee (*Eucapytus morrisii*), currawang (*Acacia doratoxylon*), white cypress pine (*Callitris glaucophylla*), western red box *(Eucalyptus intertexta*), mulga (*Acacia aneura*), silver cassia (*Senna artemisioides*), and green fuchsia bush (*Eremophila serrulata*). Mid to lower slopes support abundant mulga, belah (*Casuarina cristata*), yarran (*Acacia homalophylla*), moderate silver cassia, narrow-leaf wax flower (*Eriostemon linearis*), western red box, ironwood (*Acacia excelsa*)), white cypress pine, punty bush (*Senna eremophila*), turpentine (*Eremophila sturtii*), and budda (*Eremophila mitchellii*) with long greybeard grass (*Amphipogon caricinus*), wire grass (*Aristida* sp.), and purple love grass (*Eragrostis lacunaria*). Surrounding sandy footslopes and plains carry moderate mulga, red box, rosewood (*Alectryon oleifolius*), leopardwood (*Flindersia maculosa*), narrow-leaf hopbush (*Dodonaea viscosa*), ruby saltbush (*Enchylaena tomentosa*), black bluebush (*Maireana pyramidata*), dead finish (*Acacia tetragonophylla*), belah

(*Casuarina cristata*), wire grass (*Aristida* sp.), variable spear grass (*Austrostipa variabilis*), woollybutt (*Eragrostis eriopoda*), kerosene grass (*Aristida contorta*) and copperburr (*Sclerolaena* sp.). Dense red mallee *(Eucalyptus socialis*) with porcupine grass (*Triodia irritans*) on sand accumulations. White cypress pine and bimble box *(Eucalyptus populnea*) with kangaroo grass (*Themeda triandra*) along creeks.

Nkb Neckarbo Range CP Barnato

Neckarbo Range landscape includes parts of two land systems: *Booroondarra* and *Mulga Downs.*

Low bevelled and rounded Devonian quartzite, sandstone and conglomerate strike ridges, rocky cliffs, colluvial slopes, narrow to broad drainage lines, relief 50 to 120m. Shallow, sandy lithosols becoming deeper and better developed down slope, narrow valleys of red earths, incised drainage tracts with bare rock or sandy creek beds and levees.

Moderate to dense mallee *(Eucalyptus* sp.), currawang (*Acacia doratoxylon*), white cypress pine (*Callitris glaucophylla*), western red box *(Eucalyptus intertexta*), mulga (*Acacia aneura*) and green fuchsia bush (*Eremophila serrulata*) on upper slopes and scarps; abundant mulga, moderate silver cassia (*Senna artemisioides*), narrow-leaf wax flower (*Eriostemon linearis*) and other shrubs with long greybeard grass (*Amphipogon caricinus*), wire grass (*Aristida* sp.), and purple love grass (*Eragrostis lacunaria*) on lower slopes. White cypress pine and bimble box *(Eucalyptus populnea*) along creeks. Dense red mallee *(Eucalyptus socialis*) with porcupine grass (*Triodia irritans*) on sand accumulations.

Meso: CP Cobar

Cbh Canbelego - Boppy Hills CP Cobar

Canbelego - Boppy Hills landscape includes parts of three land systems: *Boppy, Mineshaft* and *Wynwood.*

Strike ridges, isolated peaks, of Devonian quartz-feldspar porphyry and low ranges, hills and footslopes of Silurian and Ordovician phyllite, slate, quartzite, schist and shale with narrow incised drainage tracts, relief 50 to 180m. Extensive rock outcrop with sandy and loamy lithosols grading to rubbly red earths down slope with uniform sandy soils along incised drainage channels.

Open to dense grey mallee *(Eucalyptus morrisii*) and green mallee *(Eucalyptus viridis*), some mulga (*Acacia aneura*), currawang (*Acacia doratoxylon*), white cypress pine (*Callitris glaucophylla*), western red box *(Eucalyptus intertexta*), and scattered red ironbark *(Eucalyptus sideroxylon*) on ridges and hills. Western golden wattle (*Acacia decora*), silver cassia (*Senna artemisioides*), cough bush (*Cassinia laevis*), wonga vine (*Pandorea pandorana*), budda (*Eremophila mitchellii*), broad-leaf hopbush (*Dodonaea viscosa*), rock fern (*Cheilanthes sieberi*), variable spear grass (*Austrostipa variabilis*), white-top (*Austrodanthonia cae*spi*tosa*), wire grass (*Aristida* sp.), kangaroo grass (*Themeda triandra*) and forbs.

Crb Cobar Basalt Hills CP Cobar

Cobar Basalt Hills landscape is made up of part of the *Kergunyah* land system.

Plateau or peaked ridges on Tertiary basalt, relief to 80m. Shallow, stony, brown sandy soils, becoming slightly deeper and better developed down slope, support wilga (*Geijera parviflora*), kurrajong (*Brachychiton populneus*), beefwood (*Grevillea striata*), bimble box *(Eucalyptus populnea*), western bloodwood (*Corymbia terminalis*), ironwood (*Acacia excelsa*), turpentine (*Eremophila sturtii*); medics, galvanised burr (*Scleroleana birchii*), perennial short grasses and forbs.

Crd Cobar Downs CP Cobar

Cobar Downs landscape includes parts of seven land systems: *Cobar, Coolabah, Ironstone, Killala, Kopyje, Pirillie* and *Prattenville.*

A landscape complex of slightly undulating rounded ridges and higher residuals of many Ordovician and Silurian sedimentary and metamorphic rocks, undulating rounded Devonian sandstone ridges or low plateau, rounded ridges with siliceous and ferruginous stones from Cretaceous or Tertiary conglomerates. Occasional overlying sand dune. Well defined dendritic drainage lines vary from broad to narrow, relief 10 to 20m. Scattered rock outcrop on ridges, stony surfaces common on slopes. Shallow gravelly loamy soils, or ferruginous clay loam on ridges, grading to deeper acid and neutral red earths with hardpan down slope and calcareous red earths with areas of gilgai in drainage lines. Deep sands, sandy earths, and red earths on dunes.

Moderate to dense mulga (*Acacia aneura*), green mallee *(Eucalyptus viridis*), red mallee *(Eucalyptus socialis*), belah (*Casuarina cristata*) on crests. White cypress pine (*Callitris glaucophylla*), bimble box *(Eucalyptus populnea*) western red box *(Eucalyptus intertexta*), wilga (*Geijera parviflora*), turpentine (*Eremophila sturtii*), budda (*Eremophila mitchellii*), punty bush (*Senna eremophila*), yarran (*Acacia homalophylla*), coolabah apple (*Angophora melanoxylon*), emu bush (*Eremophila longifolia*), whitewood (*Atalaya hemigluaca*), hopbush (*Dodonaea* sp.) and ironwood (*Acacia excelsa*) with many other woody species and grasses on slopes. Bimble box, white cypress pine, broad-leaved hopbush (*Dodonaea viscosa*), budda and curly windmill grass (*Enteropogon acicularis*) along drainage lines. Coolabah apple and quinine bush (*Alstonia constricta*) on dunes.

Crg Cobar Granite Downs CP Cobar

Cobar Granite Downs landscape is made up of part of the *Tindera* land system.

Low rounded ridges on Silurian granite, with occasional outcrops, relief to 10m. Shallow loamy soils, grading down slope to deeper neutral red earths with hardpan. Dense to moderate mulga (*Acacia aneura*), bimble box *(Eucalyptus populnea*), emu bush (*Eremophila longifolia*), broad-leaf hopbush (*Dodonaea viscosa*) and budda (*Eremophila mitchellii*); variable speargrass (*Austrostipa variabilis*), wiregrass (*Aristida* sp.), woollybutt (*Eragrostis eriopoda*) and forbs.

Cri Cobar Incised Streams CP Cobar

Cobar Incised Streams landscape is made up of part of the *Yanda* land system.

Major drainage lines flowing to the Darling River off the Cobar Peneplain. Floodplains of Quaternary alluvium with stable incised slightly sinuous channels, small stony rises, relief to 3m. Deep red earths with hardpan on plains with scattered to dense bimble box *(Eucalyptus populnea*), white cypress pine (*Callitris glaucophylla*), rosewood (*Alectryon oleifolius*), mulga (*Acacia aneura*), turpentine (*Eremophila sturtii*), budda (*Eremophila mitchellii*), wiregrass (*Aristida* sp.), variable spear grass (*Austrostipa variabilis*), Queensland blue grass (*Dichanthium sericeum*), red-leg grass (*Bothriochloa macra*), and *Panicum* sp. Dense bimble box, white cypress pine, budda and lignum (*Muehlenbeckia cunninghammii*) in the creek lines. Ironwood (*Acacia excelsa*) and mulga on stony rises.

Crh Cobar Isolated Hills CP Cobar

Cobar Isolated Hills landscape includes small areas of two land systems: *Boppy* and *Mineshaft.*

Isolated low strike ridges, hills and footslopes of Ordovician and Silurian phyllite, slate, schist, some Devonian quartzite, occasional igneous rocks and shale, relief typically less than

40 to 60m. Scattered rock outcrop with sandy and loamy lithosols grading to red texture-contrast soils earths down slope with red earths and uniform sandy soils along drainage channels.

Open to dense grey mallee *(Eucalyptus morrisii*) and green mallee *(Eucalyptus viridis*), some mulga (*Acacia aneura*), currawang (*Acacia doratoxylon*), white cypress pine (*Callitris glaucophylla*), western red box *(Eucalyptus intertexta*), and scattered red ironbark *(Eucalyptus sideroxylon*) on ridges and hills. Western golden wattle (*Acacia decora*), silver cassia (*Senna artemisioides*), broad-leaf hopbush (*Dodonaea viscosa*), wedge-leaf hopbush (*Dodonaea viscosa*), variable spear grass (*Austrostipa variabilis*), mulga grass (*Thyridolepis mitchelliana*) and rock fern (*Cheilanthes sieberi*).

Crs Cobar Plains CP Cobar

Cobar Plains landscape includes parts of two land systems: *Coronga* and *Kenilworth.*

Colluvial and alluvial plains, low stony rises and poorly defined drainage lines with few larger swamps with lunettes, overall relief to 3m locally to 10m on some swamps and lunettes. Moderate to deep neutral red earths with hardpan and gravel.

Dense to moderate mulga (*Acacia aneura*), western red box *(Eucalyptus intertexta*), bimble box *(Eucalyptus populnea*), ironwood (*Acacia excelsa*), white cypress pine (*Callitris glaucophylla*), punty bush (*Senna eremophila*), turpentine (*Eremophila sturtii*), budda (*Eremophila mitchellii*), emu bush (*Eremophila longifolia*), wiregrass (*Aristida* sp.), variable spear grass (*Austrostipa variabilis*) and kerosene grass (*Aristida contorta*) on plains. Bimble box, turpentine and grasses in drainage lines. Grey cracking clays with gilgai, and red texture-contrast soils in larger swamps with scattered to dense bimble box, lignum (*Muehlenbeckia cunninghammii*), wiregrass, woollybutt (*Eragrostis eriopoda*), windmill grass (*Chloris truncata*), kangaroo grass (*Themeda triandra*), dark roly-poly (*Sclerolaena muricata*), medics and burr.

Crt Cobar Tablelands CP Cobar

Cobar Tablelands landscape consists of parts of *Jack's* land system.

Small low plateau and associated slopes on Tertiary silicified sandstone, relief 30 to 40m. Brown sandy to loamy lithosols on crests, red earths and brown texture-contrast soils on slopes.

Scattered wilga (*Geijera parviflora*), mulga (*Acacia aneura*), beefwood (*Grevillea striata*), supplejack (*Ventilago viminalis*) and ironwood (*Acacia excelsa*) with budda (*Eremophila mitchellii*), hopbush (*Dodonaea* sp.) and dogwood (*Myoporum deserti*) on crests. Moderate leopardwood (*Flindersia maculosa*), scattered wilga, mulga, budda and grasses on the slopes.

Gun Gunderbooka Range CP Cobar

Gunderbooka Range landscape includes parts of two land systems: *Booroondarra* and *Mineshaft.*

Prominent range of Devonian quartzite, conglomerate and shale folded into a shallow syncline with high rocky cliffs, stepped slopes and surrounding debris slopes, relief to 300m. Extensive areas of bare rock and sandy lithosols becoming deeper and better developed down slope, narrow valleys of red earths, incised drainage tracts with bare rock. Shallow gravelly loamy soils grading to deeper acid and neutral red earths with hardpan down slope and in drainage lines.

Moderate to dense mulga (*Acacia aneura*), green mallee *(Eucalyptus viridis*), and white cypress pine (*Callitris glaucophylla*) on upper slopes. Moderate to dense mallee, currawang

(*Acacia doratoxylon*), white cypress pine, western red box *(Eucalyptus intertexta*), mulga and green fuchsia bush (*Eremophila serrulata*) on upper slopes and scarps; abundant mulga, moderate silver cassia (*Senna artemisioides*), narrow-leaf wax flower (*Eriostemon linearis*) and other shrubs with long greybeard grass (*Amphipogon caricinus*), wire grass (*Aristida* sp.), and purple love grass (*Eragrostis lacunaria*) on lower slopes. White cypress pine, river red gum *(Eucalyptus camaldulensis*) and bimble box along creeks.

Oxr Oxley Range CP Cobar

Oxley Range landscape includes parts of two land systems: *Booroondarra* and *Cobar.*
Isolated peaks of Devonian quartzite, sandstone and conglomerate, low rocky cliffs, relief to 200m. Extensive areas of bare rock and sandy lithosols becoming deeper and better developed down slope, narrow valleys of red earths, incised drainage tracts with bare rock. Shallow gravelly loamy soils grading to deeper acid and neutral red earths with hardpan down slope and in drainage lines.

Moderate to dense mulga (*Acacia aneura*), green mallee *(Eucalyptus viridis*), and white cypress pine (*Callitris glaucophylla*) on upper slopes. Moderate to dense mallee, currawang (*Acacia doratoxylon*), white cypress pine, western red box *(Eucalyptus intertexta*), mulga and green fuchsia bush (*Eremophila serrulata*) on upper slopes and scarps; abundant mulga, moderate silver cassia (*Senna artemisioides*), narrow-leaf wax flower (*Eriostemon linearis*) and other shrubs with long greybeard grass (*Amphipogon caricinus*), wire grass (*Aristida* sp.), and purple love grass (*Eragrostis lacunaria*) on lower slopes. White cypress pine and bimble box *(Eucalyptus populnea*) along creeks.

Sgh Shearlegs Hills CP Cobar

Shearlegs Hills landscape is made up of parts of three land systems: *Boppy, Glenown* and *Mineshaft.*

Hilly to steep country of strike ridges, hills and footslopes on Ordovician and Silurian schist, phyllite, quartz greywacke, slate, and mudstone, relief 70 to 160m. Rock outcrop common with sandy and loamy lithosols grading to red earths down slope.

Dense grey mallee *(Eucalyptus morrisii*) and green mallee *(Eucalyptus viridis*), white cypress pine (*Callitris glaucophylla*) and bimble box *(Eucalyptus populnea*). Western golden wattle (*Acacia decora*), Deane's wattle (*Acacia deanei*), broad-leaf hopbush (*Dodonaea viscosa*), twiggy daisy-bush (*Olearia ramulosa*), cough bush (*Cassinia laevis*), variable spear grass (*Austrostipa variabilis*), long greybeard grass (*Amphipogon caricinus*) and wire grass (*Aristida* sp.).

Meso: CP Cocoparra

Bgp Burgooney Plains CP Cocoparra

Burgooney Plains landscape is made up of part of the *Burgooney* land system.

Extensive plains and low angle footslopes of Quaternary colluvium and alluvium, with low hills and rises of Devonian sandstones and siltstones, relief 5 to 15m.

Lithosols and calcareous red earths with moderate to dense bimble box *(Eucalyptus populnea*), currawang (*Acacia doratoxylon*), white cypress pine (*Callitris glaucophylla*), Dwyer's mallee gum *(Eucalyptus dwyeri*), red ironbark *(Eucalyptus sideroxylon*), pointed mallee *(Eucalyptus socialis*), red mallee *(Eucalyptus oleosa*), wilga (*Geijera parviflora*), sugarwood (*Myoporum platycarpum*) and grey box *(Eucalyptus microcarpa*). Dense patches of punty bush (*Senna eremophila*), wedge-leaf hopbush (*Dodonaea viscosa*) and Deane's wattle (*Acacia deanei*) with speargrass (*Austrostipa* sp.), wallaby grass (*Austrodanthonia* sp.) and annual grasses and forbs.

Cor Cocoparra Ranges and Footslopes CP Cocoparra

Cocoparra Ranges and Footslopes landscape is made up of part of land systems: *Cocoparra* and *Naradhan.*

Steep crested ranges, ridges, hills and associated footslopes of Quaternary colluvium with outcrops of upper Devonian sandstone, conglomerate and siltstones. Cliff faces to 30m, bouldery hill slopes with overall relief to 260m. Extensive rock outcrop, shallow sandy lithosols, acid, neutral and calcareous red earths on slopes and deep sandy alluvium in creek lines.

On ranges; scattered white cypress pine (*Callitris glaucophylla*), currawang (*Acacia doratoxylon*), Dwyer's mallee gum *(Eucalyptus dwyeri*), and red ironbark *(Eucalyptus sideroxylon*); locally dense broombush (*Melaleuca uncinata*), hill tea-tree (*Leptospermum divaricatum*), urn heath (*Melichrus urceolatus*), wedge-leaf hopbush (*Dodonaea viscosa*), punty bush (*Senna eremophila*), cough bush (*Cassinia laevis*), sugarwood (*Myoporum platycarpum*), grey box *(Eucalyptus microcarpa*), wilga (*Geijera parviflora*), and Deane's wattle (*Acacia deanei*); rock fern (*Cheilanthes sieberi*), wire grass (*Aristida* sp.), mulga grass (*Thyridolepis mitchelliana*), short grasses and forbs. On lower slopes bimble box *(Eucalyptus populnea*), white cypress pine, mallees, yarran (*Acacia homalophylla*), wilga, emu bush (*Eremophila longifolia*) and various acacia with grasses and forbs.

Chl Curriba Basalt Hills CP Cocoparra

Curriba Basalt Hills landscape is represented by parts of the *Gulgo* land system.

Rounded hills and small plateau on Tertiary basalt, relief 100 to 220m. Loamy lithosols and friable red earths with widespread cover of boulders. White cypress pine (*Callitris glaucophylla*), kurrajong (*Brachychiton populneus*), bimble box *(Eucalyptus populnea*), western red box *(Eucalyptus intertexta*), wilga (*Geijera parviflora*), western golden wattle (*Acacia decora*), eastern cottonbush (*Maireana microphylla*) and grasses.

Sch Scotts Craig Hills CP Cocoparra

Scotts Craig Hills landscape includes parts of two land systems: *Belford* and *Booroondarra.*

Bevelled and rounded strike ridges, rocky cliffs, footslopes and drainage lines in Silurian and Devonian quartzite, lithic sandstone, conglomerate and small areas of granite, relief 70 to 100m. Sandy and loamy lithosols on ridges grading to deep red earths downslope and in valleys. Incised drainage tracts with bare rock or sandy creek beds and levees.

Scattered to dense white cypress pine (*Callitris glaucophylla*), belah (*Casuarina cristata*) and western red box *(Eucalyptus intertexta*) on ridges, scattered to dense white cypress pine, bimble box *(Eucalyptus populnea*), isolated clumps of narrow-leaf hopbush (*Dodonaea attenuata*) and scattered budda (*Eremophila mitchellii*) with grasses in valleys. Moderate to dense mallee, currawang (*Acacia doratoxylon*), white cypress pine, western red box, mulga (*Acacia aneura*) and green fuchsia bush (*Eremophila serrulata*) on upper slopes and scarps; abundant mulga, moderate silver cassia (*Senna artemisioides*), narrow-leaf wax flower (*Eriostemon linearis*) and other shrubs with grasses on lower slopes. River red gum *(Eucalyptus camaldulensis*), white cypress pine and bimble box along creeks.

Spd Shepherds Hill CP Cocoparra

Shepherds Hill landscape is made up of part of the *Shepherds Hi11* land system.

Strike belt of high rounded hills on Silurian quartz-feldspar porphyry, rhyolites and tuffs interbedded with slate and chert, relief to 70m.

Rock outcrop and sandy lithosols on crest with sparse Dwyer's mallee gum *(Eucalyptus dwyeri*), western red box *(Eucalyptus intertexta*), kurrajong (*Brachychiton populneus*), mulga (*Acacia aneura*), wilga (*Geijera parviflora*) and currawang (*Acacia doratoxylon*). Neutral red earths and texture-contrast soils on slopes with moderate to dense green mallee *(Eucalyptus viridis*), bimble box *(Eucalyptus populnea*), rosewood (*Alectryon oleifolius*), curly-bark wattle (*Acacia curranii*), shrubby rice-flower (*Pimelea microcephala*), long greybeard grass (*Amphipogon caricinus*), white-top (*Austrodanthonia caes*p*itosa*), mulga grass (*Thyridolepis mitchelliana*), and variable speargrass (*Austrostipa variabilis*) on lower ridges and flats.

Meso: CP Nymagee

Bel Belmont Hills CP Nymagee

Belmont Hills landscape includes parts of two land systems: *Belmont* and *Brooklyn*.

Undulating, rounded, low rocky hills and low strike ridges, colluvial debris slopes and creek lines on Ordovician slates and phyllite, relief to 80m. Gravelly red and brown texture-contrast soils with quartz gravel sheets on the surface, shallow soils over bedrock on upper slopes, deeper over colluvium on lower slopes.

Patches of green mallee *(Eucalyptus viridis*) on stony ridges. Woodlands of Dwyer's mallee gum *(Eucalyptus dwyeri*), red ironbark *(Eucalyptus sideroxylon*), white cypress pine (*Callitris glaucophylla*), currawang (*Acacia doratoxylon*), and grey box *(Eucalyptus microcarpa*) with scattered kurrajong (*Brachychiton populneus*), wilga (*Geijera parviflora*), budda (*Eremophila mitchellii*) and occasional rosewood (*Alectryon oleifolius*) on slopes. Bimble box *(Eucalyptus populnea*) along creek lines Ridge top patches of green mallee *(Eucalyptus viridis*), acacia (*Acacia* sp.), white cypress pine and occasional small stands of black cypress pine (*Callitris endlicheri*). Extensively modified by clearing and regeneration.

Bkr Black Range CP Nymagee

Black Range landscape includes parts of five land systems: *Boona, Boppy, Mineshaft, Warrowie* and *Wynwood.*

Strike ridges, isolated peaks, of Devonian quartz-feldspar porphyry, low ranges, hills and footslopes of Silurian and Ordovician phyllite, slate, quartzite, schist and shale, and low ridges and tors of Silurian granite. All with narrow incised drainage tracts, relief 50 to 270m. Extensive rock outcrop with sandy and loamy lithosols grading to rubbly red earths and red texture-contrast soils down slope with uniform sandy soils along sinuous incised drainage channels.

Open to dense grey mallee *(Eucalyptus morrisii*) and green mallee *(Eucalyptus viridis*), some mulga (*Acacia aneura*), currawang (*Acacia doratoxylon*), white cypress pine (*Callitris glaucophylla*), western red box *(Eucalyptus intertexta*), bimble box *(Eucalyptus populnea*), Dwyer's mallee gum *(Eucalyptus dwyeri*), kurrajong (*Brachychiton populneus*) and scattered red ironbark *(Eucalyptus sideroxylon*) on ridges and hills. Western golden wattle (*Acacia decora*), silver cassia (*Senna artemisioides*), cough bush (*Cassinia laevis*), wonga vine (*Pandorea pandorana*), budda (*Eremophila mitchellii*), broad-leaf hopbush (*Dodonaea viscosa*), rock fern (*Cheilanthes sieberi*), variable spear grass (*Austrostipa variabilis*), white-top (*Austrodanthonia caes*p*itosa*), wire grass (*Aristida* sp.), kangaroo grass (*Themeda triandra*) and forbs. Bimble box or river red gum *(Eucalyptus camaldulensis*) with grasses along streams.

Bon Boona Mountains CP Nymagee

Boona Mountains landscape includes parts of five land systems: *Boona* and *Murtonga.*

Prominent strike ridges of Devonian pebbly quartz sandstone, and shales, limited areas of limestone. Low cliffs alternate with soil covered benches, relief to 210m. Thin, stony, sandy loams grade to red and red-yellow texture-contrast profiles on slopes.

Crests and upper slopes dominated by green mallee *(Eucalyptus viridis*), or Dwyer's mallee gum *(Eucalyptus dwyeri*), currawang (*Acacia doratoxylon*), hill tea-tree (*Leptospermum divaricatum*), and stunted white cypress pine (*Callitris glaucophylla*). Mid-slopes red ironbark *(Eucalyptus sideroxylon*) and white cypress pine, lower slopes red ironbark, grey box *(Eucalyptus microcarpa*), bimble box *(Eucalyptus populnea*) with a mixed acacia (*Acacia* sp.) understorey.

Bjh Buckambool - Jackermaroo Hills CP Nymagee

Buckambool-Jackermaroo Hills landscape includes parts of four land systems: *Belford, Booroondarra, Mulga Downs* and *Warrowie.*

Bevelled and rounded strike ridges and rocky cliffs of Devonian quartzite, sandstone and conglomerate, relief to 200m. Lower, partly bevelled rocky hills and footslopes with narrow alluvial valleys, relief to 30m. Associated areas of low ridges with outcrops and tors of granite with narrow, incised drainage, relief to 30m. Sandy and loamy lithosols on ridges grading to deep red earths down slope and in valleys. Incised drainage tracts with bare rock or sandy creek beds and levees.

Scattered to dense white cypress pine (*Callitris glaucophylla*), belah (*Casuarina cristata*), western red box *(Eucalyptus intertexta*), mallee *(Eucalyptus* sp.), currawang (*Acacia doratoxylon*), mulga (*Acacia aneura*), silver cassia (*Senna artemisioides*), and green fuchsia bush (*Eremophila serrulata*) on ridges and scarps. Scattered to dense white cypress pine, bimble box *(Eucalyptus populnea*), isolated clumps of narrow-leaf hopbush (*Dodonea attenuata*) and scattered budda (*Eremophila mitchellii*) with wire grass (*Aristida* sp.) and variable speargrass (*Austrostipa variabilis*) on slopes and valleys. River red gum *(Eucalyptus camaldulensis*), white cypress pine, and bimble box along creeks. In granite areas; Dwyer's mallee gum *(Eucalyptus dwyeri*), tumbledown red gum *(Eucalyptus dealbata*), white cypress pine, western red box, kurrajong (*Brachychiton populneus*), bimble box, scattered western golden wattle (*Acacia decora*), variable spear grass, and wire grass. River red gum and bimble box along major creeks. Dense red mallee *(Eucalyptus socialis*) with porcupine grass (*Triodia irritans*) on occasional sand accumulations.

Fif Fifield Intrusives CP Nymagee

Fifield Intrusives landscape is represented by the *Fifield* land system.

Undulating hills and gentle slopes on Devonian gabbro - peridotite intrusions, relief to 40m. Deep uniform and gradational soil profiles of dark brown loams and clay loams supporting grey box *(Eucalyptus microcarpa*) and red ironbark *(Eucalyptus sideroxylon*) with bimble box *(Eucalyptus populnea*) along the creek lines. Extensively cleared and cultivated.

Gbr Gilgunnia - Broken Ranges CP Nymagee

Gilgunnia-Broken Ranges landscape includes parts of seven land systems: *Belford, Booroondarra, Boppy, Eremeran, Mineshaft, Warrowie* and *Wynwood.*

Complex ranges of bevelled and rounded Devonian quartzite, sandstone and conglomerate over Ordovician or Silurian phyllite and schist. Strike ridges, rocky cliffs, and peaks. Steep slopes with narrow incised drainage lines, relief to 200m. Rounded ridges of quartzite, conglomerate, and sandstone, relief to 180m. Some areas of rounded ranges and hills on Silurian quartz-feldspar porphyry, or granite with tors, incised sandy channels, relief to 100m. In some locations the landscape is reduced to rocky hills and footslopes. Rock outcrop on

crests, abundant surface stone with loamy and sandy lithosols grading to deep red earths down slope and in valleys. Incised drainage tracts with bare rock or sandy beds and levees.

Scattered to dense white cypress pine (*Callitris glaucophylla*), belah (*Casuarina cristata*), western red box *(Eucalyptus intertexta*), grey mallee *(Eucalyptus morrisii*), green mallee *(Eucalyptus viridis*), mulga (*Acacia aneura*), currawang (*Acacia doratoxylon*), Dwyer's mallee gum *(Eucalyptus dwyeri*), western golden wattle (*Acacia decora*), silver cassia (*Senna artemisioides*), mint bush (*Prostanthera* sp.), twiggy daisy bush (*Olearia ramulosa*), wedge-leaf hopbush (*Dodonaea viscosa*), cough bush (*Cassinia laevis*) and green fuchsia (*Eremophila serrulata*) with variable spear grass (*Austrostipa variabilis*), wire grass (*Aristida* sp.) on ridges, upper slopes and scarps. Scattered to dense white cypress pine, bimble box *(Eucalyptus populnea*), budda (*Eremophila mitchellii*), green mallee, red box, kurrajong (*Brachychiton populneus*), abundant mulga, moderate silver cassia, narrow-leaf wax flower (*Eriostemon linearis*), isolated clumps of narrow-leaf hopbush (*Dodonaea attenuata*) and scattered western golden wattle, wonga vine (*Pandorea pandorana*), budda, wire grass, long grey beard grass (*Amphipogon caricinus*) and variable spear grass on lower slopes. White cypress pine, bimble box and river red gum *(Eucalyptus camaldulensis*) fringing creeks.

Mer Meryula Alluvial Plains CP Nymagee

Meryula Alluvial Plains landscape includes parts of three land systems: *Bulbodney, Meryula* and *Verona.*

Floodplains, gilgai plains and terrace remnants of Quaternary alluvium and distal colluvium adjacent to the narrow incised channel of Bulbodney Creek, partly underlain by a thin veneer of Jurassic conglomerate, sandstones and claystones, relief 1 to 2m. Mostly brown and grey clays on alluvium with uniform or gradational light coloured sandy profiles with limited development of yellow texture-contrast soils on claystones.

Open cleared grasslands on the plains. Originally white cypress pine (*Callitris glaucophylla*), with emergent bimble box *(Eucalyptus populnea*), grey box *(Eucalyptus microcarpa*) and an understorey of rosewood (*Alectryon oleifolius*), kurrajong (*Brachychiton populneus*), yarran (*Acacia homalophylla*) and budda (*Eremophila mitchellii*). Black box *(Eucalyptus largiflorens*), myall (*Acacia pendula*), warrior bush (*Apophyllum anomalum*), climbing saltbush (*Einadia nutans*), buckbush (*Salsola kali*) and Mitchell grass (*Astrebla* sp.), along the main creeks. Bimble box and belah (*Casuarina cristata*) along tributary streams.

Ngb Nangerybone Hills CP Nymagee

Nangerybone Hills landscape includes parts of seven land systems: *Boppy, Eremeran, Mineshaft, Shepherds Hill, Warrowie* and *Yarambie*.

Rounded ridges of Devonian quartzite, conglomerate, and sandstone, over Ordovician or Silurian phyllite and schist, narrow incised drainage lines, relief to 180m. High peaked, steep hillcrests with tors of granite; poorly defined radial drainage, relief to 100m. Strike ridges of highly-rounded hills on Silurian quartz-feldspar porphyry, rhyolites and tuffs interbedded with slate and chert, relief 15 to 50m. Abundant rock outcrop with shallow sandy lithosols on crests. Shallow gravelly loams, grading to deep acid and neutral red earths with hardpan downslope, red earths with abundant surface grit on granites and in drainage lines.

Grey mallee *(Eucalyptus morrisii*), white cypress pine (*Callitris glaucophylla*), Dwyer's mallee gum *(Eucalyptus dwyeri*), mulga (*Acacia aneura*), kurrajong (*Brachychiton populneus*), currawang (*Acacia doratoxylon*), bimble box *(Eucalyptus populnea*), western golden wattle (*Acacia decora*), silver cassia (*Senna artemisioides*), mint bush (*Prostanthera* sp.), cough bush (*Cassinia laevis*), variable spear grass (*Austrostipa variabilis*), wire grass (*Aristida* sp.), and rock fern (*Cheilanthes sieberi*) on crests. Bimble box and grasses increase down slope with green mallee *(Eucalyptus viridis*), white cypress pine, western red box *(Eucalyptus intertexta*), broad-leaf hopbush (*Dodonaea viscosa* sp. sp*atulata*), long greybeard

grass (*Amphipogon caricinus* var. *caricinus*), rough spear grass (*Austrostipa scabra* var. *scabra*), and rock fern (*Cheilanthes sieberi*). Lower slopes and flats with dense red mallee *(Eucalyptus socialis*), moderate western red box, white cypress pine, budda (*Eremophila mitchellii*), warrior bush (*Apophyllum anomalum*), rosewood (*Alectryon oleifolius*), curly-bark wattle (*Acacia curranii*), shrubby rice-flower (*Pimelea microcephala*), long greybeard grass, white-top (*Austrodanthonia caes*p*itosa*), mulga grass (*Thyridolepis mitchelliana*), and variable speargrass. Dense white cypress pine, bimble box, broad-leaf hopbush, budda, and kangaroo grass (*Themeda triandra*) along drainage lines. River red gum *(Eucalyptus camaldulensis*) and bimble box along major creeks.

Ngd Nymagee Downs CP Nymagee

Nymagee Downs landscape includes parts of eleven land systems: *Boulkra, Cobar, Cottage, Hartwood, Ironstone, Killala, Kopyje, Lilyvale, Taringa* and *Yackerboon*.

Undulating rounded Ordovician, Silurian or Devonian quartzite, sandstone or phyllite ridges with narrow and broad drainage flats, relief 10 to 20m. Undulating silcrete ridges with long low slopes and broad level plains, relief to 20m. Drainage lines up to 1 km wide. Shallow, stony, loamy and sandy soils on crests, deep, calcareous red earths and solonized brown soils with gilgai on plateau, grading to deeper acid, neutral or calcareous red earths and red texture-contrast soils with hardpan down slope.

Bimble box *(Eucalyptus populnea*), western red box *(Eucalyptus intertexta*), mallee *(Eucalyptus* sp.), mulga (*Acacia aneura*), warrior bush (*Apophyllum anomalum*), rosewood (*Alectryon oleifolius*), turpentine (*Eremophila sturtii*), narrow-leaf hopbush (*Dodonaea attenuata*), western golden wattle (*Acacia decora*), budda (*Eremophila mitchellii*), kurrajong (*Brachychiton populneus*), silver cassia (*Senna artemisioides*), broad-leaved hopbush (*Dodonaea viscosa*), wire grass (*Aristida* sp.), rough spear grass (*Austrostipa scabra*), red-leg grass (*Bothriochloa macra*), and windmill grass (*Chloris truncata*) on crests. Bimble box, red box, wilga (*Geijera parviflora*), turpentine, budda, punty bush (*Senna eremophila*), hopbush (*Dodonaea* sp.), yarran (*Acacia homalophylla*) and ironwood (*Acacia excelsa*) with many other woody shrubs and grasses on lower slopes. Western red box, bimble box, yarran and budda with grasses in drainage lines.

Ngg Nymagee Granite Downs CP Nymagee

Nymagee Granite Downs landscape includes parts of two land systems: *Majuba* and *Penshurst.*

Slightly undulating footslope and outwash areas from the *Wynwood* land system, derived from quartz feldspar porphyry, relief to 8m. Also, very broad undulating lowlands and residuals with scattered granite outcrops and tors, incised drainage, relief to 8m. Red earths with areas of sandy and loamy lithosols.

Scattered to dense white cypress pine (*Callitris glaucophylla*), bimble box *(Eucalyptus populnea*), belah (*Casuarina cristata*), western red box *(Eucalyptus intertexta*), needlewood (*Hakea leucoptera*), isolated budda (*Eremophila mitchellii*), punty bush (*Senna eremophila*), Deane's wattle (*Acacia deanei*), variable spear grass (*Austrostipa variabilis*), white-top (*Austrodanthonia caes*p*itosa*), wire grass (*Aristida* sp.), and purple love grass (*Eragrostis lacunaria*). Red earths with surface mantle of grit on lower slopes with white cypress pine, bimble box, rosewood (*Alectryon oleifolius*), needlewood, kurrajong (*Brachychiton populneus*), isolated clumps of mallee *(Eucalyptus* sp.). Dense bimble box and river red gum *(Eucalyptus camaldulensis*) along minor drainage tracts with abundant grasses.

Ngi Nymagee Incised Streams CP Nymagee

Nymagee Incised Streams is represented by parts of the *Yanda* land system.

Narrow floodplains of Quaternary alluvium with stable incised channels, relief to 3m. Calcareous and neutral red earths, often with a hardpans, and gravelly alluvium in the stream line.

Dense bimble box *(Eucalyptus populnea*) and white cypress pine (*Callitris glaucophylla*), but often cleared. Clumped turpentine (*Eremophila sturtii*), budda (*Eremophila mitchellii*) on plains with ironwood (*Acacia excelsa*) and sparse mulga (*Acacia aneura*) on stony rises. Numerous grasses.

Ngh Nymagee Isolated Bedrock Hills CP Nymagee

Nymagee Isolated Bedrock Hills landscape includes parts of five land systems; *Belford, Booroondarra, Mineshaft, Mulga Downs* and *Wynwood.*

Isolated rounded hills, low strike ridges and rocky cliffs with associated drainage lines and lower slopes of Ordovician, Silurian or Devonian quartzite, sandstone, conglomerate, quartz-feldspar porphyry, phyllite, slate and schist. Relief 20 to 70m. Rocky outcrops, sandy lithosols becoming deeper and better developed down slope, narrow valleys of red earths, incised drainage tracts with bare rock or sand.

Moderate to dense mulga (*Acacia aneura*), grey mallee *(Eucalyptus morrisii*), currawang (*Acacia doratoxylon*), white cypress pine (*Callitris glaucophylla*), western red box *(Eucalyptus intertexta*), silver cassia (*Senna artemisioides*), and green fuchsia bush (*Eremophila serrulata*) on upper slopes and scarps. Abundant mulga, moderate silver cassia, green mallee *(Eucalyptus viridis*), belah (*Casuarina cristata*), narrow-leaf wax flower (*Eriostemon linearis*) and other shrubs with long greybeard grass (*Amphipogon caricinus*), wire grass (*Aristida* sp.), and purple love grass (*Eragrostis lacunaria*) on lower slopes. Scattered to dense white cypress pine, bimble box *(Eucalyptus populnea*), isolated clumps of narrow-leaf hopbush (*Dodonaea attenuata*) and scattered budda (*Eremophila mitchellii*) with wire grass and variable speargrass (*Austrostipa variabilis*), in valleys. White cypress pine and bimble box along creeks, river red gum *(Eucalyptus camaldulensis*) fringing larger creeks, dense red mallee *(Eucalyptus socialis*) with porcupine grass (*Triodia irritans*) on sand accumulations.

Ngl Nymagee Linear Dunes CP Nymagee

Nymagee Linear Dunes landscape includes parts of three land systems: *Bindi, Glenlea* and *Lachlan Downs.*

Extensive Quaternary alluvial and aeolian deposits reworked into east-west orientated dunes and plains of alluvial and aeolian deposits with small level open areas, relief to 10m. Low sloping sandplains with some dunes, abutting and partly overlying ranges and hills, relief to 20m. Plains of deep calcareous red earths with dense mallee and broombush. Dunes of deep red siliceous sends and sandy earths with calcareous red earths and red texture-contrast soils on plains, swales with deep calcareous red earths and red texture-contrast soils.

Dense mallee *(Eucalyptus* sp.), broombush (*Melaleuca uncinata*) and porcupine grass (*Triodia irritans*) on dunes. Western red box *(Eucalyptus intertexta*), hooked needlewood (*Hakea tephrosperma*), punty bush (*Senna eremophila*) and grasses in swales. Plains and dunes of dense red mallee *(Eucalyptus socialis*), broombush, porcupine grass, short grasses and forbs. Open corridors with western red box *(Eucalyptus intertexta*), mulga (*Acacia aneura*), white cypress pine (*Callitris glaucophylla*), punty bush, wire grass (*Aristida* sp.) other grasses and forbs.

Nga Nymagee Ranges CP Nymagee

Nymagee Ranges landscape includes parts of six land systems: *Boppy, Eremeran, Glenown, Mineshaft, Warrowie* and *Wynwood.*

Rounded strike ridges of folded Ordovician and Silurian sandstone, quartzite, phyllite and shale with strongly-benched slopes, relief to 140m. Rounded ridges of Devonian quartzite, conglomerate, and sandstone, over Ordovician or Silurian phyllite and schist, narrow incised drainage lines, relief to 180m. Steep hillcrests and low ridges with tors of granite or Silurian quartz-feldspar porphyry, relief to 30m. Abundant rock outcrop with sandy and loamy lithosols becoming deeper down slope and in drainage tracts. Abundant surface grit on granite hills.

Moderate to dense grey mallee *(Eucalyptus morrisii*), green mallee *(Eucalyptus viridis*), Dwyer's mallee gum *(Eucalyptus dwyeri*), white cypress pine (*Callitris glaucophylla*), currawang (*Acacia doratoxylon*), mulga (*Acacia aneura*), western golden wattle (*Acacia decora*), twiggy daisy bush (*Olearia ramulosa*), wedge-leaf hopbush (*Dodonaea viscosa*), silver cassia (*Senna artemisioides*), mint bush (*Prostanthera* sp.) and rock fern (*Cheilanthes sieberi*) on upper slopes. Dense green mallee *(Eucalyptus viridis*), white cypress pine, bimble box *(Eucalyptus populnea*), wonga vine (*Pandorea pandorana*), western red box *(Eucalyptus intertexta*), broad-leaf hopbush (*Dodonaea viscosa*), long greybeard grass (*Amphipogon caricinus*), rough spear grass (*AustroAustrostipa scabra*) and wire grasses (*Aristida* sp.) on lower slopes. White cypress pine and bimble box with western golden wattle (*Acacia decora*) and kangaroo grass (*Themeda triandra*) becoming dominant in drainage lines. River red gum *(Eucalyptus camaldulensis*) and bimble box along major creeks.

Ngs Nymagee Sandplains CP Nymagee

Nymagee Sandplains landscape includes parts of five land systems: *Karwarn, Lysmoyle, Nombinnie, Romani* and *Wyloona.*

Level sandplains of Quaternary alluvium with low hummocky rises, isolated low rises of Silurian siltstone and sandstone, relief 2 to 4m. Calcareous red earths and solonized brown soils with hummocks of deep, red siliceous sands.

Dense belah (*Casuarina cristata*), rosewood (*Alectryon oleifolius*), white mallee *(Eucalyptus dumosa*), red mallee *(Eucalyptus socialis*), porcupine grass (*Triodia irritans*), mallee cypress pine (*Callitris verrucosa*), broombush (*Melaleuca uncinata*), spur-wing wattle (*Acacia triptera*), spine bush (*Acacia colletioides*), cactus pea (*Bossiaea walkeri*), with white cypress pine (*Callitris glaucophylla*), wilga (*Geijera parviflora*), needlewood (*Hakea leucoptera*), scattered warrior bush (*Apophyllum anomalum*), narrow-leaf hopbush (*Dodonaea attenuata*), turpentine (*Eremophila sturtii*), variable spear grass (*Austrostipa variabilis*), medics (*Medicago* sp.), blue crowfoot (*Erodium cygnorum*), paper daisies (*Helichrysum* sp.). Bimble box *(Eucalyptus populnea*) and river red gum *(Eucalyptus camaldulensis*) along through running creeks. Western red box *(Eucalyptus intertexta*), bimble box, white cypress pine, yarran (*Acacia homalophylla*), rosewood, wilga (*Geijera parviflora*), and kurrajong on low rocky rises.

Ngw Nymagee Wide Valleys CP Nymagee

Nymagee Wide Valleys landscape includes parts of two land systems: *Needlewood* and *Pangee.*

Extensive level plains of Quaternary alluvium on granite, relief to 2m. Also with in-flowing broad drainage lines, small swamps and through-running incised channels, relief 5m. Calcareous red earths with thin surface mantle of grit support open bimble box *(Eucalyptus populnea*), western red box *(Eucalyptus intertexta*), white cypress pine (*Callitris glaucophylla*), yarran (*Acacia homalophylla*), needlewood (*Hakea leucoptera*), scattered budda (*Eremophila mitchellii*), warrior-bush (*Apophyllum anomalum*), Deane's wattle (*Acacia deanei*), narrow-leaf hopbush (*Dodonaea attenuata*), eastern cottonbush (*Maireana microphylla*), wiregrass (*Aristida* sp.), variable spear grass (*Austrostipa variabilis*), and forbs.

Creeks, with broad concave channels, and minor drainage tracts and isolated subterminal pans of grey clay with river red gum *(Eucalyptus camaldulensis*), bimble box, and scattered lignum (*Muehlenbeckia cunninghammii*). Mottled yellow texture-contrast soils in swamps with bimble box and lignum. Alluvial soils of medium and coarse texture in channels with bimble box, river red gum, rushes, nardoo (*Marsilea drummondii*) and grasses.

Pap Pangee Alluvial Plains CP Nymagee

Pangee Alluvial Plains landscape is represented by the *Pangee* land system.

Extensive plains of Quaternary alluvium draining from undulating country on the eastern edge of the Cobar peneplain, relief to 3m. Deep calcareous red earths with hardpan at depth.

Scattered bimble box *(Eucalyptus populnea*), white cypress pine (*Callitris glaucophylla*), warrior bush (*Apophyllum anomalum*), budda (*Eremophila mitchellii*), wire grass (*Aristida* sp.), umbrella grass (*Digitaria* sp.), windmill grass (*Chloris truncata*), variable spear grass (*Austrostipa variabilis*), other grasses and forbs. Through-running creeks with incised channels and flats with dense bimble box or river red gum *(Eucalyptus camaldulensis*), sedges and grasses. Scattered small swamps with yellowish texture-contrast soils.

Tot Tottenham Hills CP Nymagee

Tottenham Hills landscape includes parts of two land systems: *Albert* and *Tottenham.*

Undulating hills and low stony rises and lower slopes on Ordovician slate, schist, phyllite, quartz greywacke and quartzite with minor inter-bedded volcanics, relief 30 to 60m. Red and yellow texture-contrast soils, poorly drained with harsh clay B horizons along drainage lines, extensive surface gravels and stone layers of white quartz.

Woodlands and open-forest of grey box *(Eucalyptus microcarpa*), white cypress pine (*Callitris glaucophylla*), with wilga (*Geijera parviflora*), budda (*Eremophila mitchellii*), broad-leaf hopbush (*Dodonaea viscosa*), shrubby understorey and sparse grasses. Bimble box *(Eucalyptus populnea*) and belah (*Casuarina cristata*) tend to concentrate on lower slopes and along drainage lines. Some mallee ridges carry black cypress pine (*Callitris endlicheri*) and red ironbark *(Eucalyptus sideroxylon*).

Wyr Waranary - Yathong Ranges CP Nymagee

Waranary-Yathong Ranges landscape includes parts of four land systems: *Belford, Booroondarra, Mulga Downs* and *Taringa.*

Devonian quartzite, sandstone and conglomerate strike ridges, rocky cliffs, and associated slopes. Relief 30 to 200m. Undulating Tertiary silcrete ridges with long low slopes and broad level plains, relief to 20m. Sandy lithosols becoming deeper and better developed down slope, narrow valleys of red earths, incised drainage tracts with bare rock or sandy beds and levees.

Scattered to dense mallee *(Eucalyptus* sp.), white cypress pine (*Callitris glaucophylla*), belah (*Casuarina cristata*), mulga (*Acacia aneura*), and western red box *(Eucalyptus intertexta*) on ridges, scattered to dense white cypress pine, bimble box *(Eucalyptus populnea*), currawang (*Acacia doratoxylon*), isolated clumps of narrow-leaf hopbush (*Dodonaea attenuata*) and scattered budda (*Eremophila mitchellii*) with long greybeard grass (*Amphipogon caricinus*), wire grass (*Aristida* sp.), and purple love grass (*Eragrostis lacunaria*) and variable speargrass (*Austrostipa variabilis*) on slopes and valleys. Dense red mallee *(Eucalyptus socialis*) with porcupine grass (*Triodia irritans*) on sand accumulations. White cypress pine, bimble box and river red gum *(Eucalyptus camaldulensis*) along creeks.

DRP - Descriptions for Landscapes in the Darling Riverine Plains Bioregion

Meso: DRP Lower Darling

Lda Lower Darling Alluvial Plains DRP Lower Darling
Lower Darling Alluvial Plains landscape includes parts of three land systems: *Canally, Denian* and *Teryawynia.*

Sca1ded alluvial flats and sand dunes of Quaternary sediments adjacent to the Darling River floodplain. Floodplain, backplains and sinuous ephemeral channels, dunes in some channel loops, relief to 7m. Flats of silty or cracking grey clays, dunes and sandplains of deep sandy brown soils or texture-contrast soils, locally calcareous. Plains with sandy red and yellow texture-contrast and alluvial soils. Grey cracking clays in channels, reddish-brown texture-contrast soils on plains and sands on dunes.

Sparse prickly wattle (*Acacia victoriae*) and occasional clumps of narrow-leaf hopbush (*Dodonaea attenuata*), moderate bluebush (*Maireana* sp.), annual forbs, tall kerosene grass (*Aristida browniana*) and variable speargrass (*Austrostipa variabilis*) on dunes. Channels, floodplains and margins of the flats lined with black box *(Eucalyptus largiflorens*), lignum (*Muehlenbeckia cunninghamii*), canegrass (*Eragrostis australasica*), copperburr (*Sclerolaena* sp.), saltbush (*Atriplex* sp.) and annual forbs, scattered black box, river red gum *(Eucalyptus camaldulensis*) and river cooba (*Acacia stenophylla*), lignum, and annual grasses. River red gum around billabongs.

Ldc Lower Darling Channels and Floodplains DRP Lower Darling
Lower Darling Channels and Floodplains landscape includes parts of three land systems: *Acres Billabong, Ana Branch* and *Darling*.

Lower Darling River frontage and broad floodplains of Quaternary alluvial sediment. Highly sinuous intermittently flowing anabranches with channels, narrow plains between channel loops, and lateral floodouts, adjacent to the *Nelyambo* land system, with associated channels, billabongs, swamps, lunettes and plains. Channels incised 10 to 15m. Heavy grey cracking clays with some sandy earths and sands within channel loops. Self-mulching and cracking grey clays with areas of scalded red and brown texture-contrast soils on plains. Lunettes and rises of deep siliceous sands and granulated clay. Grey self-mulching to silty clays; calcareous loamy sand to deep sandy red soils on levees and sand hills.

Sparse to moderate coolibah *(Eucalyptus microtheca*) and black box *(Eucalyptus largiflorens*), with river red gum *(Eucalyptus camaldulensis*) along channel banks; annual forbs, copperburr (*Sclerolaena* sp.) and saltbush (*Atriplex* sp.). Scattered black box and river cooba (*Acacia stenophylla*) with dense lignum (*Muehlenbeckia cunninghamii*) and nitre goosefoot (*Chenopodium nitrariaceum*) on plains. Abundant ephemerals after flooding. Prickly wattle (*Acacia victoriae*), narrow-leaf hopbush (*Dodonaea attenuata*) and occasional bluebush (*Maireana* sp.) on lunettes and sand hills.

Ldf Lower Darling Fresh Lakes and Swamps DRP Lower Darling
Lower Darling Lakes and Swamps landscape includes parts of four land systems: *Gunnaramby, Popiltah, Thackenbie* and *Travellers.*

Small to very large fresh water lakes and swamps with eastern shore lunettes and associated feeder channels. Filled by floodwaters from the Lower Darling River, relief 10 to 20m. Grey

cracking clays with gilgai and brown texture-contrast soils in lakes, channels and swamps. Lunettes of calcareous cemented siliceous sands and bleached sands or texture-contrast soils.

Lake beds with dense lignum (*Muehlenbeckia cunninghamii*) and nitre goosefoot (*Chenopodium nitrariaceum*); margins and channels of black box *(Eucalyptus largiflorens*), coolibah *(Eucalyptus microtheca*), moderate to dense prickly wattle (*Acacia victoriae*) and river cooba (*Acacia stenophylla*), over sparse chenopods and forbs. Lunettes with scattered prickly wattle, belah (*Casuarina cristata*), mallee *(Eucalyptus* sp.), white cypress pine (*Callitris glaucophylla*), sandhill wattle (*Acacia ligulata*), rosewood (*Alectryon oleifolius*), needlewood (*Hakea leucoptera*), whitewood (*Atalaya hemiglauca*), turpentine (*Eremophila sturtii*), sandhill canegrass (*Zygochloa paradoxa*), sparse to moderate black bluebush (*Maireana pyramidata*), sparse bottlewashers (*Enneapogon* sp.), copperburr (*Sclerolaena* sp.) and annual forbs.

Lds Lower Darling Salt Lakes and Playas DRP Lower Darling

Lower Darling Salt Lakes and Playas landscape is made up of part of the *Birdwood* land system.

Small relict lakes and lunettes of Quaternary age with extensive associated sandplains and isolated dunes. Lunettes relief to 10m, dunes to 7m. Lake floors of highly saline, gypseous or calcareous grey clays. Lunettes and dunes of deep sandy red earths, copi rises with sandy red texture-contrast soils. Sandplain of scalded to sandy solonized brown soils.

Lake beds with chenopods, canegrass (*Eragrostis australasica*) and forbs. Sandy soils with mallee *(Eucalyptus* sp.), and porcupine grass (*Triodia irritans*). Open mallee and chenopods on copi. Sandplains with belah (*Casuarina cristata*), rosewood (*Alectryon oleifolius*), sugarwood (*Myoporum platycarpum*) and mallee plus abundant grasses and forbs.

Men Menindee Sandplains DRP Lower Darling

Menindee Sandplains landscape includes parts of two land systems: *Belvedere* and *Menilta.*

Slightly undulating, partly scalded sandplains with areas of aligned and non-aligned dunes and isolated depressions in Quaternary aeolian sediments, relief to 10m. Sandplains of sandy loam to sandy solonized brown soils or texture-contrast soils, dunes of sandy soils, depressions of grey clays. Sandy to loamy solonized brown soils in swales.

Dunes with clumped belah (*Casuarina cristata*), mallee *(Eucalyptus* sp.), rosewood (*Alectryon oleifolius*), sugarwood (*Myoporum platycarpum*), white cypress pine (*Callitris glaucophylla*), black bluebush (*Maireana pyramidata*), turpentine (*Eremophila sturtii*), native cherry (*Exocarpus cuppressiformis*) and porcupine grass (*Triodia irritans*). Sandplains with similar vegetation plus bladder saltbush (*Atriplex vesicaria*), copperburr (*Sclerolaena* sp.) and grasses. Belah (*Casuarina cristata*), black box *(Eucalyptus largiflorens*) and dillon bush (*Nitraria billardieri*) on grey clays in depressions. Black box and canegrass (*Eragrostis australasica*) around depressions. Variable spear grass (*Austrostipa variabilis*), bottlewashers (*Enneapogon* sp.), cannonball burr (*Sclerolaena paradoxa*), copperburr (*Sclerolaena* sp.) and forbs throughout.

Scx Sayers Lake DRP Lower Darling

Sayers Lake landscape includes parts of three land systems: *Denian, Gunnaramby* and *Sayers.*

Broad relict drainage depressions in Quaternary fluvial, lacustrine and aeolian sediments with extensive sandplains, dunes and alluvial plains bordering floodplains, relief to 7m. Fresh water lakes and swamps of the Teryaweynya Creek overflow. Lake beds and floodplains of grey cracking clays with gilgai. Plains with sandy red and yellow texture-contrast and alluvial

soils; solonized brown soils, calcareous red earths, brown non-cracking structured clays; dunes with sands and sandy texture-contrast soils.

Floodplains and channels with black box *(Eucalyptus largiflorens*), lignum (*Muehlenbeckia cunninghamii*), canegrass (*Eragrostis australasica*), copperburr (*Sclerolaena* sp.), chenopods and annual forbs. Extensive lakebed plains of canegrass with sparse black box, prickly wattle (*Acacia victoriae*), clumps of narrow-leaf hopbush (*Dodonaea attenuata*), turpentine (*Eremophila sturtii*), moderate black bluebush (*Maireana pyramidata*), bottlewashers (*Enneapogon* sp.), and annual forbs. Fringing black box, river cooba (*Acacia stenophylla*), sparse prickly wattle and occasional clumps of narrow-leaf hopbush. Sparse bimble box *(Eucalyptus populnea*), black box, rosewood (*Alectryon oleifolius*), nelia (*Acacia loderi*), prickly wattle, narrow-leaf hopbush and black bluebush on rises. Moderate bluebush (*Maireana* sp.), annual forbs, tall kerosene grass (*Aristida browniana*) and variable speargrass (*Austrostipa variabilis*) on dunes.

Meso: DRP Mid Darling

Mda Mid-Darling Alluvial Plains DRP Mid Darling

Mid-Darling Alluvial Plains landscape includes parts of five land systems: *Buckanbe, Canally, Denian, Dunoak* and *Hermidon.*

Level plains, sca1ded alluvial flats and adjacent low terraces with occasional sand dunes in Quaternary sediments, relief 1 to 10m. Self-mulching cracking grey, brown and red clays, moderate areas of partly scalded yellow texture-contrast soils across the floodplain. Sandy yellow or red texture-contrast soils, occasional solonized brown soils on terraces approximately 3m above the floodplain.

Floodplains often treeless with sparse lignum (*Muehlenbeckia cunninghamii*), Mitchell grass (*Astrebla* sp.), Queensland blue grass (*Dichantheum sericeum*), bottlewashers (*Enneapogon* sp.), neverfail (*Eragrostis setifolia*), copperburr (*Sclerolaena* sp.), annual saltbushes (*Atriplex* sp.) and forbs. Rises with clumps of black box *(Eucalyptus largiflorens*), belah (*Casuarina cristata*), mallee *(Eucalyptus* sp.), rosewood (*Alectryon oleifolius*), leopardwood (*Flindersia maculosa*), whitewood (*Atalaya hemiglauca*), warrior bush (*Apohyllum anomalum*), and prickly wattle (*Acacia victoriae*) over bluebush (*Maireana* sp.) and grasses. Depressions rimmed with black box, lignum, eurah (*Eremophila bignoniflora*), chenopods and canegrass (*Eragrostis australasica*). River red gum *(Eucalyptus camaldulensis*), bimble box *(Eucalyptus populnea*), or coolibah *(Eucalyptus microtheca*) around billabongs. Dunes with fringing black box, sparse prickly wattle and occasional clumps of narrow-leaf hopbush (*Dodonaea attenuata*), moderate bluebush, annual forbs, tall kerosene grass (*Aristida browniana*) and variable speargrass (*Austrostipa variabilis*).

Mdn Mid-Darling Channels and Floodplains DRP Mid Darling

Mid-Darling Channels and Floodplains landscape includes parts of six land systems: *Acres Billabong, Budda, Hermidon, Long Meadow, Mid-Darling* and *Nelyambo.*

Active floodplain with highly sinuous intermittently flowing anabranches with channels, and lateral floodouts, terrace patches with recent and ancient dunes. Channels incised 10 to 15m. Quaternary alluvium of heavy grey cracking clays with some sandy earths and sands within channel loops, terrace plains with sandy yellow texture-contrast, red or yellow sands in dunes.

Mainly open with scattered clumps of coolibah *(Eucalyptus microtheca*) and black box *(Eucalyptus largiflorens*), isolated rosewood (*Alectryon oleifolius*), whitewood (*Atalaya hemiglauca*), eurah (*Eremophila bignoniflora*), lignum (*Muehlenbeckia cunninghamii*), nitre goosefoot (*Chenopodium nitrariaceum*), neverfail (*Eragrostis setifolia*), Warrego summer-grass (*Paspalidium jubiflorum*), copperburr (*Sclerolaena* sp.), annual saltbushes (*Atriplex* sp.)

and forbs. Sparse to moderate coolibah and black box, with river red gum *(Eucalyptus camaldulensis*) along channel banks. Lignum, canegrass (*Eragrostis australasica*) and eurah (*Eremophila bignoniflora*), in pans. Terrace plains with sparse whitewood (*Atalaya hemigluaca*), black box, prickly wattle (*Acacia victoriae*), clumps of narrow-leaf hopbush (*Dodonaea attenuata*), turpentine (*Eremophila sturtii*), bottlewashers (*Enneapogon* sp.) and annual forbs. Dunes with fringing black box, coolibah, sparse prickly wattle and occasional clumps of narrow-leaf hopbush, annual forbs, tall kerosene grass (*Aristida browniana*) and variable spear grass (*Austrostipa variabilis*).

Mdi Mid-Darling Isolated Hills DRP Mid Darling

Mid Darling Isolated Hills landscape includes parts of two land systems: *Booroondarra* and *Mulga Downs.*

Strike ridges, low bevelled and rounded hills and footslopes, rocky cliffs and narrow alluvial valleys, in Devonian quartzite, sandstone and conglomerate, relief to 20m. Shallow, stony sandy lithosols becoming deeper and better developed down slope, narrow valleys of red earths, incised drainage tracts with bare rock or sandy creek beds and levees.

Moderate to dense mallee *(Eucalyptus* sp.), currawang (*Acacia doratoxylon*), white cypress pine (*Callitris glaucophylla*), western red box *(Eucalyptus intertexta*), mulga (*Acacia aneura*) and green fuchsia bush (*Eremophila serrulata*) on upper slopes and scarps; abundant mulga, moderate silver cassia (*Senna artemisioides*), narrow-leaf wax flower (*Eriostemon linearis*) and other shrubs with long greybeard grass (*Amphipogon caricinus*), wire grass (*Aristida* sp.), and purple love grass (*Eragrostis lacunaria*) on lower slopes. White cypress pine and bimble box *(Eucalyptus populnea*) along creeks. Dense red mallee *(Eucalyptus socialis*) with porcupine grass (*Triodia irritans*) on sand accumulations.

Mdl Mid-Darling Lakes and Swamps DRP Mid Darling

Mid-Darling Lakes and Swamps landscape includes parts of two land systems: *Popelloe* and *Thackenbie.*

Small to very large lakes of Quaternary age frequently filled by floodwaters from the Darling River and scalded plains with small stranded lakes and cane grass swamps, relief to 7m. Large lake beds with eastern shore lunettes and narrow inter-connecting channels. Lunettes of sandy calcareous or texture-contrast soils, relief to 15m.

Red texture-contrast soils with shallow sandy surface, sparse needlewood (*Hakea leucoptera*), nelia (*Acacia loderi*), bimble box *(Eucalyptus populnea*), prickly wattle (*Acacia victoriae*), turpentine (*Eremophila sturtii*), bottlewashers (*Enneapogon* sp.), copperburr (*Sclerolaena* sp.), annual saltbushes (*Atriplex* sp.) and forbs on the plains. Small lakes of heavy grey clay with overlying sandy deposits around shorelines, fringing black box *(Eucalyptus largiflorens*), bimble box, annual saltbushes, copperburr, rat's-tail couch (Sp*orobolus mitchelli*) and forbs. Coolibah *(Eucalyptus microtheca*) and canegrass (*Eragrostis australasica*) on pans of compact heavy clays with sparse coolibah and black box. Lunettes with rosewood (*Alectryon oleifolius*), needlewood (*Hakea leucoptera*), whitewood (*Atalaya hemiglauca*), turpentine and grasses.

Mds Mid-Darling Plains DRP Mid Darling

Mid-Darling Plains landscape is made up of part of the *East Toorale* land system.

Plains of Quaternary alluvium with poorly defined drainage lines, small internally draining sinks and swamps, relief to 5m. Calcareous sandy to loamy red earths, red and brown texture-contrast soils with cracking or plastic grey to brown clays in swamps.

Scattered to dense belah (*Casuarina cristata*), ironwood (*Acacia excelsa*), bimble box *(Eucalyptus populnea*), mulga (*Acacia aneura*), coolibah *(Eucalyptus microtheca*), some gidgee (*Acacia cambagei*), turpentine (*Eremophila sturtii*), budda (*Eremophila mitchellii*), warrior bush (*Apophyllum anomalum*), narrow-leaf hopbush (*Dodonaea attenuata*) on plains. Bimble box, coolibah, bluebush (*Maireana* sp.); cotton bush (*Maireana aphylla*), neverfail (*Eragrostis setifolia*), copperburr (*Sclerolaena* sp.), galvanised burr (*Sclerolaena birchii*) and forbs on floodplain, swamps and sinks.

Mdt Mid-Darling Tablelands DRP Mid Darling

Mid-Darling Tablelands landscape includes parts of three land systems *Prattenville*, *Pulgamurtie* and *Womparley.*

Low rounded ridges with surface siliceous stones and boulders, relief to 10m. Dissected low stony tablelands of Tertiary silcrete on Cretaceous sandstone with breakaways, relief to 30m. Often partly obscured by sandplain. Shallow to moderately deep acid loamy to sandy red earths. Brown lithosols and deeper red desert loams with red clays in gilgai depressions on lower slopes.

Mulga (*Acacia aneura*), western bloodwood (*Corymbia tesselaris*), desert poplar (*Codonocarpus cotinifolius*), silver cassia (*Senna artemisioides*), narrow-leaf hopbush (*Dodonaea attenuata*), and grasses on the plateau. Scattered mulga, and cabbage-tree wattle (*Acacia cana*) on scarps, moderate to scattered mulga, bimble box *(Eucalyptus populnea*), whitewood (*Atalaya hemiglauca*), ironwood (*Acacia excelsa*), scattered budda (*Eremophila mitchellii*), turpentine (*Eremophila sturtii*), emu bush (*Eremophila longifolia*), dead finish (*Acacia tetragonophylla*), wild orange (*Capparis mitchellii*), woollybutt (*Eragrostis eriopoda*), wire grass (*Aristida* sp.), and copperburr (*Sclerolaena* sp.) with poorly developed contour banding on lower slopes extending to mulga groves and bimble box in major drainage lines. Bladder saltbush (*Atriplex vesicaria*), black bluebush (*Maireana pyramidata*), prickly wattle (*Acacia victoriae*), and grasses elsewhere.

Meso: DRP Upper Darling

Lrd Lightning Ridge Tablelands and Downs DRP Upper Darling

Lightning Ridge Tablelands and Downs landscape includes parts of *Lightning Ridge* land system.

Gravelly red ridges, sandy plateau, slopes and dendritic drainage lines on Cretaceous claystone, siltstone and sandstone, relief to 20m. Shallow to moderately deep red earths with sandy or gibber surfaces. Small depressions of grey-brown non-cracking clays.

Dense to moderate white cypress pine (*Callitris glaucophylla*), western bloodwood (*Corymbia terminalis*), mulga (*Acacia aneura*), bimble box *(Eucalyptus populnea*), silver-leaved ironbark *(Eucalyptus melanophloia*) with wilga (*Geijera parviflora*), ironwood (*Acacia excelsa*), budda (*Eremophila mitchellii*), wild lemon (*Canthium oleifolium*), emu bush (*Eremophila longifolia*), silver cassia (*Senna artemisioides*), turpentine (*Eremophila sturtii*) and narrow-leaf hopbush (*Dodonaea attenuata*). Bimble box, wilga and rosewood (*Alectryon oleifolius*) on lower slopes and around depressions. General ground cover of copper burr (*Sclerolaena* sp.), wanderrie grass (*Eriachne* sp.), bandicoot grass (*Monachather paradoxa*), galvanised burr (*Sclerolaena birchii*), rock fern (*Cheilanthes sieberi*) and forbs.

Udi Upper Darling Isolated Hills DRP Upper Darling

Very small flat top hills and rises of Tertiary quartz sandstone and conglomerate that are probably fluvial terrace remnants in the Barwon Channel and Floodplain landscape. Isolated

by floodwaters, expected to have red-brown texture-contrast soils and different vegetation, but no specific data is available.

Meso: DRP Upper Darling Bogan - Macquarie

Bop Bogan Alluvial Plains DRP Upper Darling Bogan - Macquarie
Bogan Alluvial Plains landscape includes parts of five land systems: *Budenda, Eurie, Geera, Nidgery* and *Pendia.*

Partly scalded, higher level plains along the Bogan River of Holocene alluvium represented by the meander plain and backplain facies of the Marra Creek Formation. Narrow, defined drainage lines and swamps, extensive gilgai in grey and brown clays, occasional lagoons, swamps and remnant lakes, some with low lunettes, relief to 3m. Red brown texture-contrast soils on plains with brown and grey cracking clays in sinuous patterns on backplains and light orange-brown fine to medium sands in channels and occasional source bordering dunes.

Scattered to moderate coolibah *(Eucalyptus microtheca*), black box *(Eucalyptus largiflorens*), whitewood (*Atalaya hemiglauca*), leopardwood (*Flindersia maculosa*), myall (*Acacia pendula*), bimble box *(Eucalyptus populnea*), belah (*Casuarina cristata*), wilga (*Geijera parviflora*), budda (*Eremophila mitchellii*), nepine (*Capparis lasiantha*), warrior bush (*Apophyllum anomalum*) with grasses and some saltbushes (*Atriplex* sp.) on plains. Belah (*Casuarina cristata*), bimble box, river cooba (*Acacia stenophylla*), eurah (*Eremophila bignoniflora*), lignum (*Muehlenbeckia cunninghamii*), neverfail (*Eragrostis setifolia*), Warrego summer-grass (*Paspalidium jubiflorum*), windmill grasses (*Chloris* sp.), copperburr (*Sclerolaena* sp.) and forbs on brown and grey clays. Black box, eurah and lignum in depressions. White cypress pine (*Callitris glaucophylla*) on sandy soils.

Boc Bogan Channels and Floodplains DRP Upper Darling Bogan - Macquarie
Bogan Channels and Floodplains landscape includes parts of six land systems: *Bogan, Budenda, Eurie, Hermidon, Long Meadow* and *Upper Darling*.

Floodplains of sinuous perennial and ephemeral tributaries of the Bogan River, channels incised 5 to 10m into Holocene alluvium of the Marra Creek formation. Marginal extensive scalded plains with highly sinuous ephemeral streams, channels incised to 2m, few pans, relief to 5m. Deep cracking, crab-holey, grey clays, clay loams and isolated areas of red-brown texture-contrast soils.

Dense belah (*Casuarina cristata*), whitewood (*Atalaya hemiglauca*), black box *(Eucalyptus largiflorens*), budda (*Eremophila mitchellii*), myall (*Acacia pendula*), yarran (*Acacia homalophylla*), belah (*Casuarina cristata*), saltbushes (*Atriplex* sp.) and blue bushes (*Maireana* sp.) on plains. Fringing river red gum *(Eucalyptus camaldulensis*), black box, bimble box *(Eucalyptus populnea*), coolibah *(Eucalyptus microtheca*), river cooba (*Acacia stenophylla*), along channels. Belah (*Casuarina cristata*), lignum (*Muehlenbeckia cunninghamii*), canegrass (*Eragrostis australasica*), and eurah (*Eremophila bignoniflora*), in pans. Cumbungi (*Typha orientalis*) in still waterholes. Wide variety of grasses including; neverfail (*Eragrostis setifolia*), umbrella canegrass (*Leptochloa digitata*), Warrego summer grass (*Paspalidium jubiflorum*), fairy grass (Sp*orobolus caroli*), and Mitchell grasses (*Astrebla* sp.).

Bls Bogan Swamps and Lagoons DRP Upper Darling Bogan - Macquarie
Bogan Swamps and Lagoons landscape includes parts of the *Budenda* land system.

Small pans, depressions and swamps of Quaternary alluvium on the Bogan floodplain, often sinuous channel remnants or sub-circular features, with rare lunette development, relief to 3m. Compact grey and brown clays, gilgai on gravelly brown clay.

Fringing bimble box *(Eucalyptus populnea*), eurah (*Eremophila bignoniflora*), and river red gum *(Eucalyptus camaldulensis*). Swamp floors with clumped lignum (*Muehlenbeckia cunninghamii*), and extensive canegrass (*Eragrostis australasica*). White cypress pine (*Callitris glaucophylla*) and rosewood (*Alectryon oleifolius*) on lunettes. Gilgai with open to dense belah (*Casuarina cristata*), occasional budda (*Eremophila mitchellii*), grey box *(Eucalyptus microcarpa*) and bimble box.

Cwp (now BCP) Boggy Cowal Alluvial Plains DRP Upper Darling Bogan - Macquarie
Pleistocene fluvial sediments of backplain facies of the Carrabear Formation associated with the Boggy Cowal distributary stream system. Medium to heavy grey cracking clays with extensive gilgai. Carbonate nodules common in the subsoil and worked to gilgai crests, local relief to 2m.

Extensive grasslands with scattered stands of myall (*Acacia pendula*), bimble box *(Eucalyptus populnea*), black box *(Eucalyptus largiflorens*) and belah (*Casuarina cristata*).

Bcc Boggy Cowal Channels and Floodplains DRP Upper Darling Bogan - Macquarie
Pleistocene fluvial sediments of channel and meander plain facies of the Carrabear Formation associated with the Boggy Cowal distributary stream system. Sediments are mainly fine sands, relatively clean in channels and forming structureless red-brown loamy sand on the plains.

Originally mainly white cypress pine (*Callitris glaucophylla*) woodland, now extensively cleared. Slightly heavier soils in shallow depressions dominated by bimble box *(Eucalyptus populnea*), belah (*Casuarina cristata*) and myall (*Acacia pendula*).

Bcl Boggy Cowal Swamps and Lagoons DRP Upper Darling Bogan - Macquarie
Ephemeral Pleistocene circular or sinuous swamps and lagoons in depressions in the alluvial plains. Some recognised as Depression Facies in the Carrabear Formation, local relief to 5m and some are linked to source bordering dunes or low lunettes on their eastern side.

Fringing river red gum *(Eucalyptus camaldulensis*), lignum (*Muehlenbeckia cunninghamii*) and grasses on the depression floor and white cypress pine (*Callitris glaucophylla*) on adjacent lunettes or sand bodies.

Bcp (now BWS) Bugwah Alluvial Plains DRP Upper Darling Bogan - Macquarie
Pleistocene fluvial sediments of backplain facies of the Bugwah Formation associated with the Bugwah Cowal distributary stream system, relief to 3m. Yellow-brown to grey-brown silty clay with patches of sand and carbonate nodules, often with gilgai. Slightly elevated areas with red-brown texture-contrast soils.

Grasslands and saltbushes (*Atriplex* sp.) with scattered clumps of coolibah *(Eucalyptus microtheca*), black box *(Eucalyptus largiflorens*), belah (*Casuarina cristata*), lignum (*Muehlenbeckia cunninghamii*) and myall (*Acacia pendula*).

Buf Bugwah Channels and Floodplains DRP Upper Darling Bogan - Macquarie
Pleistocene fluvial sediments of channel, meander plain and crevasse splay facies of the Bugwah Formation associated with the Bugwah Cowal distributary stream system. Sinuous

channels, levees and oxbows with evident scroll bar patterns and outbreaks of sediment onto the adjacent Bugwah Alluvial Plains in crevasse splay deposits, local relief 3 to 5m. Channels with light brown silty clay and plains with scalded red-brown texture-contrast soils and grey cracking clay.

Channels support open woodland of fringing river red gum *(Eucalyptus camaldulensis*) and river cooba (*Acacia stenophylla*). Plains have woodlands of wilga (*Geijera parviflora*), leopardwood (*Flindersia maculosa*), bimble box *(Eucalyptus populnea*), and chenopods with locally dense belah (*Casuarina cristata*), whitewood (*Atalaya hemiglauca*), myall (*Acacia pendula*), coolibah *(Eucalyptus microtheca*), black box *(Eucalyptus largiflorens*), river cooba, budda (*Eremophila mitchellii*), lignum (*Muehlenbeckia cunninghamii*), saltbushes (*Atriplex* sp.), grasses and forbs.

Bwl Bugwah Swamps and Lagoons DRP Upper Darling Bogan - Macquarie
Rare ephemeral Pleistocene circular or sinuous swamps and lagoons in depressions in the alluvial plains, relief to 5m and some are linked to source bordering dunes or low lunettes on their eastern side.

Fringing river red gum *(Eucalyptus camaldulensis*), lignum (*Muehlenbeckia cunninghamii*) and grasses on the depression floor and white cypress pine (*Callitris glaucophylla*) on adjacent lunettes or sand bodies.

Bwp Burroway Plains DRP Upper Darling Bogan - Macquarie
Burroway Plains landscape includes parts of two land systems: *Budenda* and *Hermidon.*

Pleistocene fluvial sediments of backplain facies of the Bugwah Formation associated with the Gunningbar Creek distributary stream system of the distal Macquarie-Bogan alluvial fan. Scalded plains with highly sinuous through-running ephemeral streams, channels incised to 5m, few pans. Red and brown texture-contrast soils, grey cracking clays in channels.

Grasslands and saltbushes with locally dense belah (*Casuarina cristata*), leopardwood (*Flindersia maculosa*), whitewood (*Atalaya hemiglauca*), myall (*Acacia pendula*) and budda (*Eremophila mitchellii*). Neverfail (*Eragrostis setifolia*), umbrella canegrass (*Leptochloa digitata*), Warrego summer-grass (*Paspalidium jubiflorum*), fairy grass (Sporobolus *caroli*), annual saltbushes (*Atriplex* sp.), copperburr (*Sclerolaena* sp.) and forbs. Black box *(Eucalyptus largiflorens*), coolibah *(Eucalyptus microtheca*) and river cooba (*Acacia stenophylla*), scattered lignum (*Muehlenbeckia cunninghamii*) and eurah (*Eremophila bignoniflora*), on channels and lagoons.

Mcp Macquarie Alluvial Plains DRP Upper Darling Bogan - Macquarie
Holocene fluvial sediments of backplain facies of the Marra Creek Formation associated with the Macquarie River main alluvial fan and distributary stream system, relief 1 to 3m. Dark yellow-brown silty clay with patches of sand and carbonate nodules deposited from suspended sediments in floodwater, often with gilgai. Slightly elevated areas with red-brown texture-contrast soils.

Open grasslands with scattered coolibah *(Eucalyptus microtheca*), black box *(Eucalyptus largiflorens*), river cooba (*Acacia stenophylla*), bimble box *(Eucalyptus populnea*), belah (*Casuarina cristata*), lignum (*Muehlenbeckia cunninghamii*) and myall (*Acacia pendula*).

Mcf Macquarie Channels and Floodplains DRP Upper Darling Bogan - Macquarie
Holocene fluvial sediments of the channel and meander facies of the Marra Creek Formation associated with the Macquarie River main alluvial fan and distributary stream system, relief in the channels to 15m. Highly sinuous narrow channels partly entrenched in the meander plain and partly breaking out into multiple distributaries to the marshes. Brown to grey silt,

cracking clay with lenses and layers of light grey sand and abundant organic matter. Streamflow is permanent and the channel has large pools and multiple benches on the steep banks.

River red gum *(Eucalyptus camaldulensis*), black box *(Eucalyptus largiflorens*), river cooba (*Acacia stenophylla*) and some coolibah *(Eucalyptus microtheca*) on channel margins. Plains support open grasslands with scattered coolibah, black box, bimble box *(Eucalyptus populnea*), belah (*Casuarina cristata*), eurah (*Eremophila bignoniflora*), myall (*Acacia pendula*), lignum (*Muehlenbeckia cunninghamii*), and chenopods.

Mqm Macquarie Marshes DRP Upper Darling Bogan - Macquarie
Holocene fluvial sediments of the floodbasin, abandoned floodbasin, wetland and lagoon facies of the Marra Creek Formation of the Macquarie Marshes, local relief to 5m. Throughflow wetlands of permanent to semi-permanent water with open pools connected by a complex of trellis patterned channels. Main channels flow through the marshes but at higher levels of river discharge the floodbasins are inundated. There may be some water contribution from groundwater discharge. Organic rich surface mud over sticky blue-grey clay, silty clay in the channel banks. Gilgai are common on the margins of the swamplands. Changes in river flow, channel erosion and potential salinity are of concern.

Water depth and period of flooding strongly control vegetation patterns. Open water carries aquatic plants such as eel weed (*Vallisneria gigantea*), water-milfoil (*Myriophyllum* sp.), floating pondweed (*Potamogeton tricarinatus*) and starfruit (*Damasonium minus*). Extensive wet grasslands with beds of common reed (*Phragmites australis*), cumbungi (*Typha orientalis*) and water couch (*Paspalum paspalodes*) are found in more permanent waters. River red gum *(Eucalyptus camaldulensis*), river cooba (*Acacia stenophylla*), common reed and cumbungi line the channel margins. Less frequently flooded meadows support mixed grasslands, sedges and lignum (*Muehlenbeckia cunninghamii*). Higher and relatively dry floodplain woodland margins carry coolibah *(Eucalyptus microtheca*), black box *(Eucalyptus largiflorens*), river red gum and lignum and dry woodlands with wilga (*Geijera parviflora*), bimble box *(Eucalyptus populnea*), black box, yellow box *(Eucalyptus melliodora*), Blakely's red gum *(Eucalyptus blakelyi*) and chenopods are located on red soils on the margins.

Maa Marra Alluvial Plains DRP Upper Darling Bogan - Macquarie
Holocene fluvial sediments of backplain facies of the Marra Creek Formation along the Marra Creek distributary stream system of the Macquarie River alluvial fan, relief 1 to 3m. Dark yellow-brown silty clay with patches of sand and carbonate nodules deposited from suspended sediments in floodwater, often with gilgai. Slightly elevated areas with red-brown texture-contrast soils.

Open grasslands with scattered coolibah *(Eucalyptus microtheca*), black box *(Eucalyptus largiflorens*), river cooba (*Acacia stenophylla*), bimble box *(Eucalyptus populnea*), belah (*Casuarina cristata*), lignum (*Muehlenbeckia cunninghamii*) and myall (*Acacia pendula*).

Mal Marra Swamps and Lagoons DRP Upper Darling Bogan - Macquarie
Holocene fluvial sediments of the lagoon facies of the Marra Creek Formation and occasional Pleistocene (?) circular or sinuous swamps in depressions in the alluvial plains, some are linked to source bordering dunes or low lunettes on their eastern side, relief to 5m. Organic rich mud over sticky blue-grey clay.

Fringing river red gum *(Eucalyptus camaldulensis*), coolibah *(Eucalyptus microtheca*), lignum (*Muehlenbeckia cunninghamii*) and grasses, aquatic plants and beds of common reed (*Phragmites australis*).

Mfo Mount Foster DRP Upper Darling Bogan - Macquarie

Elongate ridge and low rounded hills of early Devonian porphyritic quartz monzonite. Bouldery rock outcrop is common with thin gritty loams on benches and in joint crevices, lower slopes with thicker cover of sandy red-brown texture-contrast soil, relief to 90m.

Open cover of stunted tumbledown red gum *(Eucalyptus dealbata*), some white cypress pine (*Callitris glaucophylla*), western pittosporum (*Pittosporum phylliraeoides*), wilga (*Geijera parviflora*), peach bush (*Ehretia membranifolia*) and wonga vine (*Pandorea pandorana*).

Trt Trangie Terrace DRP Upper Darling Bogan - Macquarie
The oldest fluvial units recognised in the upper section of the Macquarie-Bogan alluvial fan. Slightly elevated plain with northwest slope of late Pliocene and Pleistocene fluvial sand and gravel channel facies on an abandoned meander plain with flanking silty clay with sand layers of backplain facies of the Trangie Formation. Red texture-contrast soils are widespread with red sandy loams on coarser sediments, overall relief 5 to 7m.

Mostly spear grass (*Austrostipa* sp.) and wallaby grass (*Austrodanthonia* sp.) with scattered to dense patches of myall (*Acacia pendula*) or bimble box *(Eucalyptus populnea*). The myall country probably originally carried an old man saltbush (*Atriplex nummularia*) understorey but little remains. White cypress pine (*Callitris glaucophylla*), budda (*Eremophila mitchellii*) and wilga (*Geijera parviflora*) on sandy soils. Extensively grazed and cultivated.

Meso: DRP Upper Darling Castlereagh - Barwon

Clp Castlereagh Alluvial Plains DRP Upper Darling Castlereagh - Barwon
Holocene fluvial sediments of backplain and channelised backplain facies of the Marra Creek Formation associated with the Castlereagh River main alluvial fan and distributary stream system, relief 1 to 3m. Dark yellow-brown silty clay with patches of sand and carbonate nodules deposited from suspended sediments in floodwater, often with gilgai. Slightly elevated areas with red-brown texture-contrast soils.

Open grasslands with scattered coolibah *(Eucalyptus microtheca*), black box *(Eucalyptus largiflorens*), river cooba (*Acacia stenophylla*), bimble box *(Eucalyptus populnea*), belah (*Casuarina cristata*), lignum (*Muehlenbeckia cunninghamii*), saltbush (*Atriplex* sp.), warrior bush (*Apophyllum anomalum*) and myall (*Acacia pendula*).

Clc Castlereagh Channels and Floodplains DRP Upper Darling Castlereagh - Barwon
Holocene fluvial sediments of the channel and meander plain facies of the Marra Creek Formation associated with the Castlereagh River alluvial fan and distributary stream system, relief in the channels 10 to 15m. Stream flow is nearly permanent. Sinuous channels entrenched in the meander plain with a fine sand bed load. Banks and plains with brown to grey silt, cracking clay layers of red-brown sand. Areas of streambed aggradation reported near Coonamble and sand is moving downstream.

River red gum *(Eucalyptus camaldulensis*), black box *(Eucalyptus largiflorens*), river cooba (*Acacia stenophylla*) and coolibah *(Eucalyptus microtheca*) on channel margins. Plains support open grasslands with scattered coolibah, black box, bimble box *(Eucalyptus populnea*), belah (*Casuarina cristata*), wilga (*Geijera parviflora*), lignum (*Muehlenbeckia cunninghamii*) and myall (*Acacia pendula*).

Cll Castlereagh Swamps, Lagoons and DunesDRP Upper Darling Castlereagh - Barwon
Holocene fluvial sediments of the wetland, floodbasin, abandoned floodbasin and lagoon facies of the Marra Creek Formation in the Castlereagh Marshes, local relief to 5m. Through flow wetlands of permanent to semi-permanent water with open pools connected by a

complex of trellis patterned channels. Main channels flow through the marshes but at higher levels of river discharge the floodbasins are inundated. Organic rich surface mud over sticky blue-grey silty clay, silts and fine sand in the channel banks.

Water depth and period of flooding strongly control vegetation patterns. Open water carries aquatic plants such as eel weed (*Vallisneria gigantea*), water-milfoil (*Myriophyllum* sp.), floating pondweed (*Potamogeton tricarinatus*) and starfruit (*Damasonium minus*). Extensive beds of common reed (*Phragmites australis*) and lignum (*Muehlenbeckia cunninghamii*) are found in more permanent waters. River red gum *(Eucalyptus camaldulensis*), black box *(Eucalyptus largiflorens*), river cooba (*Acacia stenophylla*) and coolibah *(Eucalyptus microtheca*) line the channel margins. Less frequently flooded meadows support grasslands of water couch (*Paspalum paspalodes*) and sedges. Higher and relatively dry margins carry scattered coolibah, black box, bimble box *(Eucalyptus populnea*), yellow box *(Eucalyptus melliodora*), belah (*Casuarina cristata*), eurah (*Eremophila bignoniflora*), myall (*Acacia pendula*), lignum, and saltbush (*Atriplex* sp.).

Nad Namoi Aeolian Sands DRP Upper Darling Castlereagh - Barwon
Limited distribution Holocene source bordering sand dunes aligned along the channels and abandoned channels of the Namoi river system, relief to 5m. Poorly sorted, friable light orange-brown fine quartz sand, clay content and compaction increases with depth.

White cypress pine (*Callitris glaucophylla*) is characteristic, generally with a ground cover of grasses.

Nap Namoi Alluvial Plains DRP Upper Darling Castlereagh - Barwon
Holocene fluvial sediments of backplain and channelised backplain facies on the Namoi River and its effluent streams, relief 1 to 5m. Dark yellow-brown to brown silty clay with patches of sand and carbonate nodules deposited from suspended sediments in floodwater, often with gilgai. Slightly elevated areas with red-brown texture-contrast soils.

Open grasslands with scattered coolibah *(Eucalyptus microtheca*), black box *(Eucalyptus largiflorens*), river cooba (*Acacia stenophylla*), bimble box *(Eucalyptus populnea*), belah (*Casuarina cristata*), lignum (*Muehlenbeckia cunninghamii*), chenopods, warrior bush (*Apophyllum anomalum*) and myall (*Acacia pendula*). Extensively cleared, cropped and grazed.

Nac Namoi Channels and Floodplains DRP Upper Darling Castlereagh - Barwon
Holocene fluvial sediments of channel and meander plain facies of the Namoi River alluvial fan and distributary stream system, relief in the channels 10 to 15m. Stream flow is nearly permanent. Sinuous channels entrenched in the meander plain with a fine sand bed load. Banks and plains with brown to grey silt, cracking clay layers of red-brown sand.

Fringing river red gum *(Eucalyptus camaldulensis*), black box *(Eucalyptus largiflorens*), river cooba (*Acacia stenophylla*) and coolibah *(Eucalyptus microtheca*) with understorey of grasses, and saltbushes (*Atriplex* sp.).

Tep Teridgerie Alluvial Plains DRP Upper Darling Castlereagh - Barwon
Holocene fluvial sediments of backplain and channelised backplain facies on the Teridgerie Creek, relief to 10m. Brown silty clay with patches of sand and carbonate nodules deposited from suspended sediments in floodwater, often with gilgai in grey and brown clays. Elevated areas with red-brown texture-contrast soils. Sediment grain size increases toward the ranges.

Open grasslands with scattered coolibah *(Eucalyptus microtheca*), black box *(Eucalyptus largiflorens*), river cooba (*Acacia stenophylla*), bimble box *(Eucalyptus populnea*), belah (*Casuarina cristata*), lignum (*Muehlenbeckia cunninghamii*), chenopods, warrior bush (*Apophyllum anomalum*) and myall (*Acacia pendula*). Extensively cleared, cropped and grazed.

Tef Teridgerie Channels and Floodplains DRP Upper Darling Castlereagh - Barwon
Holocene fluvial sediments of channel and meander plain facies of the Teridgerie Creek alluvial fan and distributary stream system, relief in the channels to 10m. Sinuous channels entrenched in the meander plain with a fine sand bed load. Banks and plains with brown to grey silt, cracking clay layers of red-brown sand.

Fringing river red gum *(Eucalyptus camaldulensis*), black box *(Eucalyptus largiflorens*), river cooba (*Acacia stenophylla*) and coolibah *(Eucalyptus microtheca*) with understorey of grasses, and chenopods.

Meso: DRP Upper Darling Culgoa - Warrambool

Cna Culgoa - Narran Alluvial Plains DRP Upper Darling Culgoa - Warrambool
Culgoa-Narran Alluvial Plains landscape includes parts of seven land systems: *Cartlands, Dumble, Gingie, Goodooga, Nidgery, Tatala* and *Toulby.*

Level and slightly elevated floodplains and plains on Quaternary alluvium interspersed by broadly looping migrating drainage channels and low sandy rises. Poorly defined drainage lines and swamps, associated sand hills and hummocks, relief 1 to 8m. Brown non-cracking and cracking clays with areas of grey cracking clays in depressions and red-brown and yellow texture-contrast soils on rises. Sand hills with yellow sands, yellow texture-contrast soils interspersed with grey cracking and non-cracking clays.

Dense clumps of gidgee (*Acacia cambagei*), with leopardwood (*Flindersia maculosa*), rosewood (*Alectryon oleifolius*) and myall (*Acacia pendula*); scattered warrior bush (*Apophyllum anomalum*), nepine (*Capparis lasiantha*), wild orange (*Capparis mitchellii*), thorny saltbush (*Rhagodia* sp*inescens*), buckbush (*Salsola kali*) and flowering lignum (*Eremophila polyclada*), occasional brigalow (*Acacia harpophylla*), understorey of neverfail (*Eragrostis setifolia*), perennial and annual saltbushes (*Atriplex* sp.), rigid panic (*Panicum prolutum*), copperburr (*Sclerolaena* sp.), other grasses and forbs. Large areas of open Mitchell grasses (*Astrebla* sp.) with minor clumps of gidgee and whitewood (*Atalaya hemiglauca*). Coolibah *(Eucalyptus microtheca*), black box *(Eucalyptus largiflorens*), river cooba (*Acacia stenophylla*), eurah (*Eremophila bignoniflora*), flowering lignum, annual saltbush (*Atriplex muelleri*) with occasional river red gum *(Eucalyptus camaldulensis*) on grey clays in channels and channelled floodplain. Dense to moderate white cypress pine (*Callitris glaucophylla*), bimble box *(Eucalyptus populnea*), leopardwood, belah (*Casuarina cristata*), wilga (*Geijera parviflora*), sandplain wattle (*Acacia murrayana*), budda (*Eremophila mitchellii*), supplejack (*Ventilago viminalis*), quinine bush (*Alstonia constricta*), sandhill riceflower (*Pimelea penicillaris*), and grasses on sandy rises.

Cnf Culgoa - Narran Channels and Floodplains DRP Upper Darling Culgoa - Warrambool
Culgoa-Narran Channels and Floodplains landscape includes parts of six land systems: *Long Meadow, Rostella, Upper Darling, Warrego, Wombeira* and *Wongal.*

Highly-channelised floodplains with small scalded areas, level and slightly undulating Quaternary alluvium. Poorly defined minor drainage lines, small elevated areas and sand

dunes within channel loops, relief 1 to 8m. Deep cracking, often crab-holey grey clays, isolated areas of yellow and red-brown texture-contrast and compact clay soils. Higher ground and Warrego river floodplains of sands and red earths with extensive scalds.

Open plains with scattered clumps of coolibah *(Eucalyptus microtheca*), black box *(Eucalyptus largiflorens*), isolated rosewood (*Alectryon oleifolius*), leopardwood (*Flindersia maculosa*) occasional gidgee (*Acacai cambegei*), whitewood (*Atalaya hemigluaca*), eurah (*Eremophila bignoniflora*), lignum (*Muehlenbeckia cunninghamii*), and nitre goosefoot (*Chenopodium nitrariaceum*). Ground cover of neverfail (*Eragrostis setifolia*), Warrego summer-grass (*Paspalidium jubiflorum*), copperburr (*Scleroleana* sp.), annual saltbushes (*Atriplex* sp.) and forbs. Sandy areas with bimble box *(Eucalyptus populnea*), wilga (*Geijera parviflora*), needlewood (*Hakea leucoptera*), white cypress pine (*Callitris glaucopylla*), budda (*Eremophila mitchellii*), nepine (*Capparis lasiantha*), prickly wattle (*Acacia victoriae*) and warrior bush (*Apophyllum anomalum*). Grey clays in depressions and pans with coolibah, bimble box, eurah, lignum and grasses. Moderate to dense coolibah, river red gum *(Eucalyptus camaldulensis*), black box, river cooba (*Acacia stenophylla*), eurah, and lignum on main channels.

Ccf Culgoa Channels and Floodouts DRP Upper Darling Culgoa - Warrambool

Culgoa Channels and floodouts landscape is made up of part of the *Nidgery* land system.

Level floodplains of Quaternary alluvium with narrow, poorly defined drainage lines swamps and floodout areas, relief to 1m. Deep grey cracking clays with minor areas of red-brown texture-contrast soils. Dense to sparse coolibah *(Eucalyptus microtheca*), myall (*Acacia pendula*), eurah (*Eremophila bignoniflora*), lignum (*Muehlenbeckia cunninghamii*), neverfail (*Eragrostis setifolia*), fairy grass (*Sporobolus caroli*), Warrego summer-grass (*Paspalidium jubiflorum*), copperburr (*Sclerolaena* sp.), annual saltbush (*Atriplex muelleri*) and forbs.

Ncx Narran Lakes DRP Upper Darling Culgoa - Warrambool

Narran Lakes landscape includes parts of two land systems: *Narran* and *Rotten Plain.*

Extensive lakebeds and terminal wetlands with associated discontinuous lunettes and sandy levee, drainage depressions and isolated salina, periodically inundated by Narran River, relief to 5m. Includes level low-lying backplains of Quaternary alluvium, usually surrounded by red country; depressed to 3m. Grey cracking clays with yellow, red and brown texture-contrast soils on lunettes and levees, non-cracking clays in depressions and salinas.

Isolated coolibah *(Eucalyptus microtheca*), fringing river red gum *(Eucalyptus camaldulensis*), river cooba (*Acacia stenophylla*) and eurah (*Eremophila bignoniflora*), around the lake. Dense clumps of lignum (*Muehlenbeckia cunninghamii*), rat's-tail couch (*Sporobolus mitchelli*), sedges, neverfail (*Eragrostis setifolia*), and Warrego summer grass (*Paspalidium jubiflorum*) on the lakebed. Treeless levee and lunette with old man saltbush (*Atriplex nummularia*), dillon bush (*Nitraria billardierei*), miljee (*Acacia oswaldii*), budda (*Eremophila mitchellii*), annual saltbushes (*Atriplex* sp.), copperburr (*Sclerolaena* sp.), grasses and forbs. Samphires (*Arthrocnemum* sp.), poverty bush (*Sclerolaena* sp.), parakeelya (*Caladrinia balonensis*) with annual saltbushes on salinas.

Meso: DRP Upper Darling Gwydir - Macintyre

Bad Barwon Aeolian Sands DRP Upper Darling Gwydir - Macintyre

Limited distribution Holocene source bordering sand dunes aligned along the channels and abandoned channels of the Barwon River system, relief to 5m. Probably includes some unrecognised low lunettes on the eastern side of relic lake features. Poorly sorted, friable orange-brown fine quartz sand, clay content and compaction increases with depth.

Open white cypress pine (*Callitris glaucophylla*) and carbeen (*Corymbia tessellaris*) is characteristic generally with a ground cover of grasses.

Bap Barwon Alluvial Plains DRP Upper Darling Gwydir - Macintyre
Barwon Alluvial Plains landscape includes parts of seven land systems: *Gingie, Jomara, Llanillo, Nidgery, Rugby, Tatala* and *Wombeira.*

Highly channelised floodplain with small scalded areas, relief to lm. Level and slightly elevated floodplains of Holocene alluvium of the backplain facies of the Marra Creek Formation with shallow discontinuous drainage lines and small low sandy rises, relief to 3m. Areas of associated sand hills and hummocks interspersed with depressions, relief to 8m. Grey cracking and non-cracking days on plains, with brown texture-contrast soils on rises. Sands interspersed with yellow texture-contrast soils, grey cracking and non-cracking clays in sand hill areas.

Myall (*Acacia pendula*), rosewood (*Alectryon oleifolius*), coolibah *(Eucalyptus microtheca*), belah (*Casuarina cristata*), wilga (*Geijera parviflora*), bimble box *(Eucalyptus populnea*), whitewood (*Atalaya hemiglauca*), leopardwood (*Flindersia maculosa*), gidgee (*Acacia cambagei*), thorny saltbush (*Rhagodia spinescens*), Mueller's saltbush (*Atriplex muelleri*), wild orange (*Capparis mitchellii*), buck bush (*Salsola kali*), warrior bush (*Apophyllum anomalum*), budda (*Eremophila mitchellii*), nepine (*Capparis lasiantha*), Mitchell grasses (*Astrebla* sp.), neverfail (*Eragrostis setifolia*), goathead burr (*Sclerolaena bicornis*), copperburr (*Sclerolaena* sp.), and Warrego summer-grass (*Paspalidium jubiflorum*), on lower clay plains and drainage lines. Coolibah, black box *(Eucalyptus largiflorens*), river cooba (*Acacia stenophylla*), eurah (*Eremophila bignoniflora*), and flowering lignum (*Eremophila polyclada*) in depressions and channels. Dense to moderate white cypress pine (*Callitris glaucophylla*), bimble box, leopardwood, belah (*Casuarina cristata*), wilga (*Geijera parviflora*), sandplain wattle (*Acacia murrayana*), prickly wattle (*Acacia victoriae*), budda, quinine bush (*Alstonia constricta*), sandhill riceflower (*Pimelea penicillaris*) and grasses on sandy rises.

Baf Barwon Channels and Floodplains DRP Upper Darling Gwydir - Macintyre
Barwon Channels and Floodplains landscape includes parts of five land systems: *Eurie, Long Meadow, Mid-Darling, Nidgery* and *Upper Darling*.

Floodplains of sinuous perennial and ephemeral tributaries of the Barwon River. Holocene alluvium of the channel and meander plain facies of the Marra Creek Formation. Channels in defined drainage lines with levees and swamps incised to 2 to 15m into alluvium. Deep grey cracking clays, often crab-holey, with minor areas of red-brown texture-contrast soils on slight elevations.

Narrow fringing river red gum *(Eucalyptus camaldulensis*) and coolibah *(Eucalyptus microtheca*) forests along deeper main channels. Floodplains with scattered to moderate coolibah, black box *(Eucalyptus largiflorens*), whitewood (*Atalaya hemiglauca*), isolated rosewood (*Alectryon oleifolius*), belah (*Casuarina cristata*), river cooba (*Acacia stenophylla*), eurah (*Eremophila bignoniflora*), lignum (*Muehlenbeckia cunninghamii*), nitre goosefoot (*Chenopodium nitatriaceum*), neverfail (*Eragrostis setifolia*), Warrego summer-grass (*Paspalidium jubiflorum*), windmill grasses (*Chloris truncata*), copperburr (*Sclerolaena* sp.) and forbs. Sparse gidgee (*Acacia cambagei*) on elevated areas.

Gyp Gwydir Alluvial PlainsDRP Upper Darling Gwydir - Macintyre

Holocene fluvial sediments of backplain and channelised backplain facies on the Gwydir River fan, relief 2 to 5m. Grey and brown silty clay deposited from suspended sediments in floodwater, often with gilgai. Elevated margins with red-brown texture-contrast soils.

Open to scattered myall (*Acacia pendula*), rosewood (*Alectryon oleifolius*), coolibah *(Eucalyptus microtheca*), belah (*Casuarina cristata*), wilga (*Geijera parviflora*), bimble box *(Eucalyptus populnea*), whitewood (*Atalaya hemiglauca*), leopardwood (*Flindersia maculosa*), gidgee (*Acacia cambagei*), thorny saltbush (*Rhagodia* sp*inescens*), Mueller's saltbush (*Atriplex muelleri*), wild orange (*Capparis mitchellii*), buck bush (*Salsola kali*), warrior bush (*Apophyllum anomalum*), budda (*Eremophila mitchellii*), nepine (*Capparis lasiantha*), Mitchell grasses (*Astrebla* sp.), neverfail (*Eragrostis setifolia*), goathead burr (*Sclerolaena bicornis*), copperburr (*Sclerolaena* sp.), and Warrego summer-grass (*Pa*sp*alidium jubiflorum*), on lower clay plains and drainage lines. Coolibah, black box *(Eucalyptus largiflorens*), river cooba (*Acacia stenophylla*), eurah (*Eremophila bignoniflora*), and flowering lignum (*Eremophila polyclada*) in depressions and channels. Dense to moderate white cypress pine (*Callitris glaucophylla*), bimble box, leopardwood, belah (*Casuarina cristata*), wilga, sandplain wattle (*Acacia murrayana*), prickly wattle (*Acacia victoriae*), budda, quinine bush (*Alstonia constricta*), sandhill riceflower (*Pimelea penicillaris*) and grasses on sandy rises. Extensively cleared, cropped and grazed.

Gyc Gwydir Channels and Floodplains DRP Upper Darling Gwydir - Macintyre

Holocene fluvial sediments of channel and meander plain facies of the Gwydir River alluvial fan and distributary stream system, relief in the channels 5 to 10m. Streamflow is nearly permanent. Sinuous channels entrenched in the meander plain with a silt and clay suspended load and some fine sand bed load. Banks and plains with brown to grey silt and cracking grey or brown clay minor areas of red-brown texture-contrast soils on low levees. The Gwydir raft is major coarse woody debris dam choking a main channel and diverting flow.

Narrow fringing river red gum *(Eucalyptus camaldulensis*) and coolibah *(Eucalyptus microtheca*) with river paper-bark (*Melaleuca trichostachya*) along deeper main channels. Floodplains with scattered to moderate coolibah, black box *(Eucalyptus largiflorens*), whitewood (*Atalaya hemiglauca*), isolated rosewood (*Alectryon oleifolius*), belah (*Casuarina cristata*), river cooba (*Acacia stenophylla*), eurah (*Eremophila bignoniflora*), lignum (*Muehlenbeckia cunninghamii*), nitre goosefoot (*Chenopodium nitatriaceum*), neverfail (*Eragrostis setifolia*), Warrego summer-grass (*Pa*sp*alidium jubiflorum*), windmill grasses (*Chloris* sp.), copperburr (*Sclerolaena* sp.) and forbs. Bimble box *(Eucalyptus populnea*) on western plains, yellow box *(Eucalyptus melliodora*) and rough-barked apple (*Angophora floribunda*) on the distal fan and higher red brown soil on terraces. Sparse gidgee (*Acacia cambagei*) on elevated areas.

Gyl Gwydir Swamps and Lagoons DRP Upper Darling Gwydir - Macintyre

Holocene fluvial sediments of lagoon and wetland facies with occasional Pleistocene (?) circular or sinuous swamps in depressions in the alluvial plains, some are linked to source bordering dunes or low lunettes on their eastern side, relief to 5m. Organic rich mud over sticky blue-grey clay.

Fringing river red gum *(Eucalyptus camaldulensis*), coolibah *(Eucalyptus microtheca*), lignum (*Muehlenbeckia cunninghamii*) and grasses, aquatic plants and beds of common reed (*Phragmites australis*) and lignum. Bimble box *(Eucalyptus populnea*) on claypans.

Mad Macintyre Aeolian Sands DRP Upper Darling Gwydir - Macintyre

Limited distribution Holocene source bordering sand dunes aligned along the channels and abandoned channels of the Macintyre River system, relief to 5m. May includes some

unrecognised low lunettes on the eastern side of relic lake features. Poorly sorted, friable orange-brown fine quartz sand, clay content and compaction increases with depth.

Open forest of white cypress pine (*Callitris glaucophylla*) and carbeen (*Corymbia tessellaris*) is characteristic, generally with a ground cover of grasses.

Mci Macintyre Alluvial Plains DRP Upper Darling Gwydir - Macintyre
Holocene fluvial sediments of meander plain and backplain facies on the Macintyre River, relief 5 to 12m. Brown silty clay with patches of sand and carbonate nodules deposited from suspended sediments in floodwater, often with gilgai in grey and brown clays. Elevated areas with red-brown texture-contrast soils. Sediment grain size increases toward the ranges.

Open grasslands with scattered coolibah *(Eucalyptus microtheca*), black box *(Eucalyptus largiflorens*), river cooba (*Acacia stenophylla*), bimble box *(Eucalyptus populnea*), belah (*Casuarina cristata*), lignum (*Muehlenbeckia cunninghamii*), chenopods, warrior bush (*Apophyllum anomalum*), gidgee (*Acacia cambagei*) and myall (*Acacia pendula*). Sparse white cypress pine (*Callitris glaucophylla*) on lighter textured soils. Patches of brigalow (*Acacia harpophylla*) on heavy soils with gilgai. Extensively cleared, cropped and grazed.

Mcl Macintyre Swamps and Lagoons DRP Upper Darling Gwydir - Macintyre
Holocene fluvial sediments of lagoon and wetland facies with occasional Pleistocene (?) circular or sinuous swamps in depressions in the alluvial plains, some are linked to source bordering dunes or low lunettes on their eastern side, relief to 5m. Organic rich mud over sticky blue-grey clay.

Fringing river red gum *(Eucalyptus camaldulensis*), coolibah *(Eucalyptus microtheca*), lignum (*Muehlenbeckia cunninghamii*) and grasses, aquatic plants and beds of common reed (*Phragmites australis*) and lignum.

MDD - Descriptions for Landscapes in the Murray Darling Depression Bioregion

Meso: MDD Ivanhoe - Nangara

Bkh Bokara Hills MDD Ivanhoe - Nangara
Bokara Hills landscape includes parts of three land systems: *Booroondarra, Coonavitra* and *Mulga Downs.*

Low bevelled and rounded strike ridges, rocky cliffs and footslopes of Devonian quartzite, sandstone and conglomerate with narrow alluvial valleys, relief to 200m. Shallow, stony sandy lithosols becoming deeper and better developed down slope, valleys of red earths, incised drainage tracts with bare rock or sandy creek beds and levees.

Moderate to dense mallee *(Eucalyptus* sp.), currawang (*Acacia doratoxylon*), white cypress pine (*Callitris glaucophylla*), western red box *(Eucalyptus intertexta*), mulga (*Acacia aneura*) and green fuchsia bush (*Eremophila serrulata*) on upper slopes and scarps; abundant mulga, moderate silver cassia (*Senna artemisiodes*), narrow-leaf wax flower (*Eriostemon linearis*) and other shrubs with grasses on lower slopes. White cypress pine and bimble box *(Eucalyptus populnea*) along creeks. Dense red mallee *(Eucalyptus socialis*) with porcupine grass (*Triodia irritans*) on sand accumulations. Footslopes of calcareous red earths with sandy

surface; moderate clumps of rosewood (*Alectryon oleifolius*), leopardwood (*Flindersia maculosa*) and belah (*Casuarina cristata*), small clumps of turpentine (*Eremophila sturtii*) and black bluebush (*Maireana pyramidata*) with variable spear grass (*Austrostipa variabilis*), bottlewashers (*Enneapogon* sp.), and cannon-ball (*Sclerolaena paradoxa*) underneath.

Hsp Hillston Sandplains MDD Ivanhoe - Nangara

Hillston Sandplains landscape includes parts of three land systems: *Lysmoyle, Karwarn* and *Nombinnie.*

Level to undulating sandplain of Quaternary aeolian sands and limited alluvium, relief 2 to 4m. Calcareous red earth and solonized brown soils with deep siliceous sands on hummocks.

Extensive dense mallee and broombush communities. Red mallee *(Eucalyptus socialis*), white mallee *(Eucalyptus dumosa*), broombush (*Melaleuca uncinata*), spur wing wattle (*Acacia triptera*), with belah (*Casuarina cristata*), rosewood (*Alectryon oleifolius*), warrior bush (*Apophyllum anomalum*), budda (*Eremophila mitchellii*), white cypress pine (*Callitris glaucophylla*), needlewood (*Hakea leucoptera*), hopbush (*Dodonea* sp.), turpentine (*Eremophila sturtii*), occasional ironbark *(Eucalyptus* sp.) and kurrajong (*Brachychiton populneus*), variable spear grass (*Austrostipa variabilis*), medics (*Medicago* sp.) and forbs.

Iap Ivanhoe - Nangara Alluvial Plains MDD Ivanhoe - Nangara

Ivanhoe-Nangara Alluvial Plains landscape includes parts of two land systems: *Curranyalpa* and *Fulham.*

Extensive plains of Quaternary alluvium with small areas of low rises, drainage sinks, and occasional ancient and recent dunes, relief to 7m. Solonized brown soils with few crab-holes and scattered rosewood (*Alectryon oleifolius*) and belah (*Casuarina cristata*), bottlewashers (*Enneapogon* sp.) and variable spear grasses (*Austrostipa variabilis*) on the plain. Low rises of calcareous red earths and occasionally sands, with ironwood (*Acacia excelsa*), mulga (*Acacia aneura*) and rosewood, and forbs. Turpentine (*Eremophila sturtii*), narrow-leaf hopbush (*Dodonaea attenuata*), annual forbs and short grasses on plains. Deep sands and solonized brown soil in dunes with scattered rosewood, belah, leopardwood (*Flindersia maculosa*), turpentine, narrow-leaf hopbush and grasses. Drainage sinks of calcareous red earths or non-cracking clay soils with dense bimble box *(Eucalyptus populnea*), turpentine, emu bush (*Eremophila longifolia*), neverfail (*Eragrostis setifolia*) and forbs.

Idn Ivanhoe - Nangara Dunes MDD Ivanhoe - Nangara

Ivanhoe-Nangara Dunes landscape includes parts of three land systems: *Gundigoono, Keewong* and *Mandleman.*

Low rounded dunes of Quaternary sand with small level areas, drainage sinks and lunettes, relief to 10m. Dunefield of parabolic and unaligned dunes merging into slightly undulating sandplains, relief to 7m. Dunes oriented both east-west and north-south with red sandy earths and solonized brown soils. Swales of calcareous red earths and solonized brown soils. Sinks and swamps on calcareous red earths and non-cracking clays with dense bimble box *(Eucalyptus populnea*).

Isolated flats of solonized brown soils with belah (*Casuarina cristata*) and rosewood (*Alectryon oleifolius*). Moderate to dense narrow-leaf hopbush (*Dodonaea attenuata*), pituri (*Duboisia hopwoodii*), woollybutt (*Eragrostis eriopoda*), wire grass (*Aristida* sp.) and forbs on dunes. Swales with scattered white cypress pine (*Callitris glaucophylla*) and ironwood (*Acacia excelsa*), narrow-leaf hopbush, turpentine (*Eremophila sturtii*), kerosene grass (*Aristida contorta*), variable spear grass (*Austrostipa variabilis*) and woollybutt (*Eragrostis eriopoda*). Bimble box, turpentine and emu bush *(Eucalyptus longifolia*) on sinks. Lunettes with bimble box and needlewood (*Hakea leucoptera*).

Ifl Ivanhoe - Nangara Fresh Lakes and Swamps MDD Ivanhoe - Nangara

Ivanhoe-Nangara Fresh Lakes and Swamps landscape is made up of part of the *Karumpito* land system.

Small lakes and lunettes of Quaternary age with local catchments in red country of the *Nelia* land system, relief 3 to 15m. Lake beds of cracking or non-cracking clays and solonized brown soils, with sandy deposits around shorelines and lunettes on the eastern margin.

Bimble box *(Eucalyptus populnea*) or black box *(Eucalyptus largiflorens*) and hybrids around shorelines, lignum (*Muehlenbeckia cunninghamii*) and canegrass (*Eragrostis australasica*) on beds. Sandy calcareous gypseous soil on lunettes with rosewood (*Alectryon oleifolius*), belah (*Casuarina cristata*), punty bush (*Senna eremophila*), black bluebush (*Maireana pyramidata*), twin-leaf (*Zygophyllum apiculatum*) and bottlewashers (*Enneapogon* sp.).

Iih Ivanhoe - Nangara Isolated Hills MDD Ivanhoe - Nangara

Ivanhoe-Nangara Isolated Hills landscape includes parts of three land systems: *Booroondarra, Lilyvale* and *Mulga Downs.*

Low bevelled and rounded strike ridges, rocky cliffs and footslopes of Devonian quartzite, sandstone and conglomerate, with narrow alluvial valleys, relief to 200m. Some rounded ridges partly covered by Quaternary aeolian sand, minor narrow incised drainage lines, relief to 20m. Shallow, stony sandy lithosols becoming deeper and better developed downslope, narrow valleys of red earths, incised drainage tracts with bare rock or sandy beds and levees.

Moderate to dense mallee *(Eucalyptus* sp.), currawang (*Acacia doratoxylon*), white cypress pine (*Callitris glaucophylla*), western red box *(Eucalyptus intertexta*), mulga (*Acacia aneura*) and green fuchsia bush (*Eremophila serrulata*) on upper slopes and scarps; abundant mulga, moderate silver cassia (*Senna artemisiodes*), narrow-leaf wax flower (*Eriostemon linearis*) and other shrubs with long greybeard grass (*Amphipogon caricinus*), wire grass (*Aristida* sp.), and purple love grass (*Eragrostis lacunaria*) on lower slopes. Dense red mallee *(Eucalyptus socialis*) with porcupine grass (*Triodia irritans*) on sand accumulations. Bimble box *(Eucalyptus populnea*) and mulga along drainage lines.

Ild Ivanhoe - Nangara Linear Dunes MDD Ivanhoe - Nangara

Ivanhoe-Nangara Linear Dunes landscape includes parts of eight land systems: *Arumpo, Bell Vale, Blackfella, Bulla Park, Cairo, Glenlea, Lachlan Downs* and *Tiltagoona.*

Parallel east-west trending dunes of Quaternary sands with narrow to broad swales and sandplain, small depressions and channels, relief 3 to 10m. Eastern margins low sloping sandplains with some dunes, abutting and partly overlying ranges and hills, relief to 20m. Deep calcareous red earths, loamy sand to red siliceous sand. Deep clayey sands, sandy earths, reddish-brown clay soils, red texture-contrast soils in swales and on sandplains. Solonized brown clay soils in sinks and channels.

Dense red mallee *(Eucalyptus socialis*), broombush (*Melaleuca uncinata*), narrow-leaf hopbush (*Dodonaea attenuata*), porcupine grass (*Triodia irritans*) and paper daisy (*Helichrysum* sp.), moderate mulga (*Acacia aneura*), white cypress pine (*Callitris glaucophylla*), western red box *(Eucalyptus intertexta*), on dunes and sandplains. Other dunes support rosewood (*Alectryon oleifolius*), belah (*Casuarina cristata*), western red box, white cypress pine, mulga and locally dense narrow-leaf hopbush with tall kerosene grass (*Aristida browniana*). Swales with belah (*Casuarina cristata*), rosewood, bimble box *(Eucalyptus populnea*), turpentine (*Eremophila sturtii*), emu bush (*Eremophila longifolia*), neverfail (*Eragrostis setifolia*), bottlewashers (*Enneapogon* sp.), variable speargrass (*Austrostipa variabilis*), copperburr (*Sclerolaena* sp.) and forbs. Some open corridors with western red box, mulga, white cypress pine, punty bush (*Senna eremophila*), wiregrass (*Aristida* sp.), other grasses and forbs. Isolated sinks with black box *(Eucalyptus largiflorens*), bimble box,

lignum (*Muehlenbeckia cunninghamii*), turpentine (*Eremophila sturtii*), emu bush (*Eremophila longifolia*), and New Zealand spinach (*Tetragonia tetragonioides*). A few channels with river red gum *(Eucalyptus camaldulensis*) in grey clays.

Irl Ivanhoe - Nangara Relic Lakes MDD Ivanhoe - Nangara
Ivanhoe-Nangara Relic Lakes landscape includes parts of two land systems: *Dalmoreve* and *Sayers.*
Broad relict drainage depressions of Quaternary age with small sub-circular to irregular remnant lakes, partially overlain by scalded sandplains with low lunettes, relief to 6m.

Depressions and lake beds of grey heavy clays with bimble box *(Eucalyptus populnea*), black box *(Eucalyptus largiflorens*) and canegrass (*Eragrostis australasica*), belah (*Casuarina cristata*), white cypress pine (*Callitris glaucophylla*), yarran (*Acacia homalophylla*) and black bluebush (*Maireana pyramidata*). Small canegrass swamps. Sandplains of calcareous sandy red duplex soils with scattered rosewood (*Alectryon oleifolius*), belah (*Casuarina cristata*) and yarran over variable stands of bluebush (*Maireana* sp.) and dillon bush (*Nitraria billardierei*). Treeless lunettes of scalded texture-contrast soils or deep sands with locally dense bluebush (*Maireana* sp.). Also, solonized brown soils, calcareous red earths, brown non-cracking structured clays with sparse rosewood, nelia (*Acacia loderi*), prickly wattle (*Acacia victoriae*), narrow-leaf hopbush (*Dodonaea attenuata*) and black bluebush on rises.

Isl Ivanhoe - Nangara Salt Lakes and Playas MDD Ivanhoe - Nangara
Ivanhoe-Nangara Salt Lakes and Playas landscape is made up of part of the *Birdwood* land system.

Small relict lakes and lunettes with of Quaternary age with extensive associated sandplains and isolated dunes.

Lake floors of highly saline, gypseous or calcareous grey clays with chenopods, canegrass (*Eragrostis australasica*) and forbs. Lunettes and dunes of deep sandy red earths with mallee *(Eucalyptus* sp.) and porcupine grass (*Triodia irritans*). Sandplain of scalded to sandy solonized brown soils with belah (*Casuarina cristata*), rosewood (*Alectryon oleifolius*), sugarwood (*Myoporum platycarpum*) and mallee plus abundant grasses and forbs.

Isp Ivanhoe - Nangara Sandplains MDD Ivanhoe - Nangara
Ivanhoe-Nangara Sandplains landscape includes parts of nineteen land systems: *Ashmont, Bindi, Coonavitra, Frenchmans, Hatfield, Karwarn, Lysmoyle, Manara, Mulururu, Nangara, Nelgadale, Nelia, Nombinnie, Overnewton, Roto, Vidale, Wilkurra, Wyloona* and *Yallock.*

Extensive, slightly undulating, partially scalded sandplains of Quaternary alluvial and aeolian deposits with a few east-west dunes, isolated small depressions and small drainage sinks. Includes aeolian sand accumulation on range footslopes, relief 3 to 10m. Solonized brown soils and texture-contrast soils on the plains. Deep calcareous red earths, red clayey sands, sandy earths, and red and brown sands on dunes. Swales with deep calcareous red earths and red texture-contrast soils. Non-cracking brown and grey clays in depressions.

Dense red mallee *(Eucalyptus socialis*), white mallee *(Eucalyptus dumosa*), broombush (*Melaleuca uncinata*), spurwing wattle (*Acacia triptera*), mallee cypress pine (*Callitris verrucosa*), and porcupine grass (*Triodia irritans*). Clumps of rosewood (*Alectryon oleifolius*), belah (*Casuarina cristata*), mulga (*Acacia aneura*), white cypress pine (*Callitris glaucophylla*), with narrow-leaf hopbush (*Dodonaea attenuata*), leopardwood (*Flindersia maculosa*), small clumps of turpentine (*Eremophila sturtii*), black bluebush (*Maireana pyramidata*) or pearl bluebush (*Maireana sedifolia*) with variable speargrass (*Austrostipa variabilis*), bottlewashers (*Enneapogon* sp.), cannon-ball (*Sclerolaena paradoxa*), copperburr (*Sclerolaena* sp.) and forbs on the plains. Open patches of western red box *(Eucalyptus*

intertexta), belah (*Casuarina cristata*), white cypress pine and wilga (*Geijera parviflora*). Black box *(Eucalyptus largiflorens*) and hybrids, dense bimble box *(Eucalyptus populnea*), lignum (*Muehlenbeckia cunninghamii*) canegrass (*Eragrostis australasica*), nitre goosefoot (*Chenopodium nitrariaceum*) and annual saltbush (*Atriplex* sp.) in swamps and pans. River red gum *(Eucalyptus camaldulensis*) on rare through running creeks.

Mrg Maccullochs Range MDD Ivanhoe - Nangara
Maccullochs Range landscape is made up of the *Maccullochs* land system.

Rolling, rounded low range of Devonian sandstone, quartzite and shale, with thin Quaternary aeolian sand accumulations. Scarps to 20m, overall relief to 70m.

Rock outcrop and shallow lithosols with mulga (*Acacia aneura*), rosewood (*Alectryon oleifolius*), emu bush (*Eremophila longifolia*), narrow-leaf hopbush (*Dodonaea attenuata*), and (*Senna* sp.) on scarps. Calcareous red earths and red sandy earths on slopes and drainage lines with, moderate to dense mulga, western red box *(Eucalyptus intertexta*), belah (*Casuarina cristata*), leopardwood (*Flindersia maculosa*), punty bush (*Senna eremophila*), emu bush, variable speargrass (*Austrostipa variabilis*), bottlewashers (*Enneapogon* sp.), mallee saltbush (*Atriplex stipitata*), paper daisies (*Helichrysum* sp.) and forbs.

Meso: MDD Mallee Cliffs

Mcu Mallee Cliffs Dunes MDD Mallee Cliffs
Mallee Cliffs Dunes landscape is made up of part of the *Mandleman* land system.

Quaternary dunefields of parabolic and unaligned dunes merging into slightly undulating sandplains, relief to 7m. Dunes and swales of deep red-brownish earthy sands with uniformly dense mallee *(Eucalyptus* sp.) and porcupine grass (*Triodia irritans*). Isolated flats of solonized brown soils with belah (*Casuarina cristata*) and rosewood (*Alectryon oleifolius*).

Mld Mallee Cliffs Linear Dunes MDD Mallee Cliffs
Mallee Cliffs Linear Dunes landscape includes parts of two land systems: *KI Downs* and *Arumpo.*
Extensive Quaternary dunefields and sandplains, relief to 7m. Deep brownish sands and calcareous earths with dense mallee *(Eucalyptus* sp.), belah (*Casuarina cristata*) and rosewood (*Alectryon oleifolius*) with porcupine grass (*Triodia irritans*). Narrow swales of calcareous loamy red earths with belah, rosewood, scattered shrubs, variable speargrass (*Austrostipa variabilis*), copperburr (*Sclerolaena* sp.) and forbs.

Mla Mallee Cliffs Salt Lakes and Playas MDD Mallee Cliffs
Mallee Cliffs Salt Lakes and Playas landscape is made up of part of the *Birdwood* land system.

Small relict lakes and lunettes of Quaternary age with extensive associated sandplains and isolated dunes. Lake floors of highly saline, gypseous or calcareous grey clays with chenopods, canegrass (*Eragrostis australasica*) and forbs. Lunettes and dunes of deep sandy red earths with mallee *(Eucalyptus* sp.), and porcupine grass (*Triodia irritans*). Sandplain of scalded to sandy solonized brown soils with belah (*Casuarina cristata*), rosewood (*Alectryon oleifolius*), sugarwood (*Myoporum platycarpum*) and mallee plus abundant grasses and forbs.

Mcs Mallee Cliffs Sandplains MDD Mallee Cliffs
Mallee Cliffs Sandplains landscape includes parts of twelve land systems: *Ashmont, Bulgamurra, Frenchmans, Gulthul, Hatfield, Menilta, Mulurulu, Overnewton, Quambi, Roo Roo, Trelega* and *Wilkura.*

Extensive, slightly undulating sandplain of Quaternary aeolian sands with east-west trending dunes, often with blowouts, partly scalded broad swales and small depressions, relief 6 to 10m. Solonized brown soils, calcareous loamy sand, and texture-contrast soils on the plain, red and brown sands on dunes, non-cracking grey or brown clays in depressions.

Rosewood (*Alectryon oleifolius*), white cypress pine (*Callitris glaucophylla*), sugarwood (*Myoporum platycarpum*), belah (*Casuarina cristata*), dense clumps of black bluebush (*Maireana pyramidata*), or pearl bluebush (*Maireana sedifolia*), with variable speargrass (*Austrostipa variabilis*), bottlewashers (*Enneapogon* sp.) and copperburr (*Sclerolaena* sp.) on plains. Scattered rosewood, belah, mallee patches *(Eucalyptus* sp.), with isolated porcupine grass (*Triodia irritans*), white cypress pine, narrow-leaf hopbush (*Dodonaea attenuata*), punty bush (*Senna eremophila*) and grasses on dunes. Annual saltbush (*Atriplex* sp.), canegrass (*Eragrostis australasica*), lignum (*Muehlenbeckia cunninghamii*) and nitre goosefoot (*Chenopodium nitrariaceum*) in depressions usually fringed by black box *(Eucalyptus largiflorens*).

Meso: MDD Mungo - Marona

Mun Mungo - Marona Dunes MDD Mungo - Marona
Mungo-Marona Dunes landscape is made up of part of the *Mandleman* land system.

Quaternary dunefield of parabolic and unaligned dunes merging into slightly undulating sandplains, relief to 7m. Dunes and swales of deep red-brownish earthy sands with uniformly dense mallee *(Eucalyptus* sp.), and porcupine grass (*Triodia irritans*). Isolated flats of solonized brown soils with belah (*Casuarina cristata*) and rosewood (*Alectryon oleifolius*).

Mul Mungo - Marona Lakes and Swamps MDD Mungo - Marona
Mungo-Marona Lakes and Swamps landscape is made up of part of the *Gunnaramby* land system.

Fresh water lakes and swamps of the Willandra Creek overflow. Lake beds of Quaternary alluvium of grey cracking clays with gilgai. Dense lignum (*Muehlenbeckia cunninghamii*) and nitre goosefoot (*Chenopodium nitrariaceum*); margins of grey clays with black box *(Eucalyptus largiflorens*) and river cooba (*Acacia stenophylla*) over sparse chenopods and forbs. Scalded red texture-contrast soils on swamp margins and levees with chenopods.

Muu Mungo - Marona Linear Dunes MDD Mungo - Marona
Mungo-Marona Linear Dunes landscape is made up of part of the *Arumpo* land system.

Parallel east-west trending dunes and sandplain of Quaternary aeolian sands with deep loamy sand to sandy red soils, relief to 7m. Dense mallee *(Eucalyptus* sp.) and areas of porcupine grass (*Triodia irritans*) on dunes and sandplain. Narrow swales of calcareous loamy red earths with belah (*Casuarina cristata*), rosewood (*Alectryon oleifolius*), scattered shrubs, variable speargrass (*Austrostipa variabilis*), copperburr (*Sclerolaena* sp.) and forbs.

Mur Mungo - Marona Relic Lakes MDD Mungo - Marona
Mungo-Marona Relic Lakes landscape includes parts of three land systems: *Dalmoreve, Marona,* and *Youhl.*

Small relict lakes of Quaternary age, some irregularly shaped adjacent to riverine plains, and pans, usually with well-developed lunettes and extensive associated dunefields, relief to 6m. Basin floors of highly saline, gypseous or calcareous grey clays, treeless, with dense bladder saltbush (*Atriplex vesicaria*) and bluebush (*Maireana* sp.); basin margins and slopes of calcareous red or brown scalded texture-contrast soils with scattered belah (*Casuarina*

cristata) and rosewood (*Alectryon oleifolius*). Sandplains of calcareous sandy red texture-contrast soils with scattered rosewood, belah and yarran (*Acacia homalophylla*) over variable stands of bluebush and dillon bush (*Nitraria billardierei*). Treeless lunettes of scalded texture-contrast soils or deep sands with locally dense bluebush. Lunettes and dunes of deep sandy red soils with dense mallee *(Eucalyptus* sp.), porcupine grass (*Triodia irritans*), scattered black bluebush (*Maireana pyramidata*) and bladder saltbush (*Atriplex vesicaria*). Depressions and lake beds with white cypress pine (*Callitris glaucophylla*), yarran and black bluebush (*Maireana pyramidata*). Small canegrass (*Eragrostis australasica*) swamps.

Mus Mungo - Marona Sandplains MDD Mungo - Marona

Mungo - Marona Sandplains landscape includes parts of four land systems: *Bulgamurra, Mulurulu, Overnewton* and *Wilkurra* located east of the Mungo Lakes Complex.

Quaternary aeolian sands formed into sandplains and hummocky low dunes, relief 3 to 8m, with scattered depressions and swamps to 500m diameter. Brownish sands, red sandy earth and solonized brown soils. Soils often calcareous.

White cypress pine (*Callitris glaucophylla*), belah (*Casuarina cristata*), rosewood (*Alectryon oleifolius*) and mallee *(Eucalyptus* sp.). Scattered clumps of narrow-leaf hopbush (*Dodonaea attenuata*), turpentine (*Eremophila sturtii*) and black bluebush (*Maireana pyramidata*) with variable speargrass (*Austrostipa variabilis*), copper burrs (*Sclerolaena* sp.) and forbs.

Mcx Mungo Lakes Complex MDD Mungo - Marona

Mungo Lakes Complex landscape includes parts of three land systems: *Garnpung*, *Leaghur* and *Mungo.*

Extensive dry lakes of Quaternary age with long low lunettes and wide inter-connecting floodplains and channels, relief to 20m. Plains with high unstable dunes and lunettes around relict lakes, relief 15 to 30m.

Lake beds of grey heavy clays or scalded red texture-contrast soils with scattered black box *(Eucalyptus largiflorens*), sparse to dense stands of cotton bush (*Maireana aphylla*), bladder saltbush (*Atriplex vesicaria*), old man saltbush (*Atriplex nummularia*), and dillon bush (*Nitraria billardierei*). Unstable crests and lunettes of deep white sands with sparse vegetation. Stable crests of deep red sands with scattered white cypress pine (*Callitris glaucophylla*), belah (*Casuarina cristata*), rosewood (*Alectryon oleifolius*), mallee *(Eucalyptus* sp.) abundant short grasses and forbs. Plains of red texture-contrast soils with scattered belah and rosewood, and bluebush (*Maireana* sp.). Treeless depressions of grey heavy clays with canegrass (*Eragrostis australasica*) or nitre goosefoot (*Chenopodium nitrariaceum*). Lunettes and source bordering dunes of cemented siliceous sand and earthy sands with belah, white cypress pine, sugarwood (*Myoporum platycarpum*), rosewood, bluebush and grasses. Sandplains of calcareous, sandy red soils with scattered white cypress pine and Severely gullied lunettes and dunes of deep, loosely cemented, whitish sands with sugarwood, mallee and black bluebush (*Maireana pyramidata*).

Meso: MDD Scotia

Std Scotia Dunes MDD Scotia

Scotia Dunes landscape is made up of part of the *Mandleman* land system.

Quaternary dunefield of parabolic and unaligned dunes merging into slightly undulating sandplains, relief to 7m. Dunes and swales of deep red-brownish earthy sands with uniformly dense mallee *(Eucalyptus* sp.), and porcupine grass (*Triodia irritans*). Isolated flats of solonized brown soils with belah (*Casuarina cristata*) and rosewood (*Alectryon oleifolius*).

Stb Scotia Groundwater Basins MDD Scotia

Scotia Groundwater Basins landscape includes parts of four land systems: *Birdwood, Dalmoreve, Huntingfield* and *Marona.*

Small sub-circular to irregular relict saline lakes and lunettes of Quaternary age with extensive associated sandplains and isolated dunes, relief to 6m Lake floors of highly saline, gypseous or calcareous grey clays with copi islands. Lunettes and dunes of deep sandy red earths, sandplains of scalded to sandy solonized brown soils. Sandy to loamy solonized brown soils in swales.

Lake floors with chenopods, canegrass (*Eragrostis australasica*) and forbs, margins with belah (*Casuarina cristata*), white cypress pine (*Callitris glaucophylla*), yarran (*Acacia homalophylla*) and black bluebush (*Maireana pyramidata*). Lunettes with mallee *(Eucalyptus* sp.), porcupine grass (*Triodia irritans*) and locally dense bluebush (*Maireana* sp.). Sandplain with belah, rosewood (*Alectryon oleifolius*), sugarwood (*Myoporum platycarpum*) and mallee plus abundant grasses and forbs.

Stl Scotia Linear Dunes MDD Scotia

Scotia Linear Dunes landscape includes parts of three land systems: *Arumpo, Ennisvale* and *Scotia.*

Parallel east-west trending Quaternary dunes and sandplain of deep loamy sand to sandy red soils, extensive gently undulating swales with aligned dunes and isolated flats, relief to 7m. Dense mallee (*Eucalyptus* sp.), belah (*Casuarina cristata*), porcupine grass (*Triodia irritans*), clumps of black bluebush (*Maireana pyramidata*), turpentine (*Eremophila sturtii*), pin-bush wattle (*Acacia burkittii*), grasses and forbs. Narrow swales of calcareous loamy red earths. Sandy solonized brown soils and red texture-contrast soils; dunes of deep brownish sands. Dense mallee and/or belah, moderate to dense shrubs and porcupine grass, seasonally abundant grasses and forbs on dunes. Dense belah and rosewood (*Alectryon oleifolius*) in swales with turpentine and sugarwood (*Myoporum platycarpum*).

Sts Scotia Sandplains MDD Scotia

Scotia Sandplains landscape includes parts of twelve land systems: *Ashmont, Belvedere, Bulgamurra, Frenchmans, Hatfield, Haythorpe, Menilta, Overnewton, Quambi, Roo Roo, Trelega* and *Wilkurra.*

Slightly undulating Quaternary sandplains with areas of east-west trending sand dunes, relief 3 to 10m. Broad swales and small depressions. Solonized brown soils and texture-contrast soils on the plains, red and brown sands and earthy sands on dunes, non-cracking clays in depressions. Mallee *(Eucalyptus* sp.) porcupine grass (*Triodia irritans*), rosewood (*Alectryon oleifolius*), belah (*Casuarina cristata*), bladder saltbush (*Atriplex vesicaria*), sugarwood (*Myoporum platycarpum*), occasional wilga (*Geijera parviflora*), white cypress pine (*Callitris glaucophylla*), moderate to dense stands of black bluebush (*Maireana pyramidata*) and pearl bluebush (*Maireana sedifolia*), turpentine (*Eremophila sturtii*), native cherry (*Exocarpus cupressiformis*) with variable speargrass (*Austrostipa variabilis*), bottlewashers (*Enneapogon* sp.), copperburr (*Sclerolaena* sp.) and forbs on plains. Dunes with belah, white cypress pine, mallee and narrow-leaf hopbush (*Dodonaea attenuata*). Annual saltbush (*Atriplex* sp.) and canegrass (*Eragrostis australasica*) in depressions rimmed by black box *(Eucalyptus largiflorens*) and dillon bush (*Nitraria billardierei*).

MUL - Descriptions for Landscapes in the Mulga Lands Bioregion

Meso: MUL Paroo – Warrego

Mmr Mt Murchison Hills and Ranges MUL Paroo - Warrego

Mt Murchison Hills and Ranges landscape includes parts of two land systems: *Euramurtie* and *Mount Pleasant.*

Rounded and partly bevelled ridges on steeply dipping Devonian sandstone and quartzite. Isolated mesa remnants on Tertiary sandstone. Dendritic drainage, relief to 100m. Sand covered footslopes and sandplains with low sandy rises and non-aligned dunes, relief to 20m.

Shallow stony soils on higher areas with belah (*Casuarina cristata*), mulga (*Acacia aneura*), whitewood (*Atalaya hemiglauca*), beefwood (*Grevillea striata*), dead finish (*Acacia tetragonophylla*), emu bush (*Eremophila longifolia*), copperburr (*Sclerolaena* sp.) and kerosene grass (*Aristida contorta*). Moderate mulga with belah on mesa remnants. Footslopes of red desert loams and mantles of silcrete, scattered mulga, bluebush (*Maireana* sp.), dead finish, belah, woollybutt (*Eragrostis eriopoda*), kerosene grass, copperburr and forbs. Red desert loams and coarse sand on lower slopes and drainage lines with rosewood (*Alectryon oleifolius*), whitewood (Atalaya hemigluaca) and grasses. River red gum *(Eucalyptus camaldulensis*) with kangaroo grass (*Themeda triandra*) along drainage lines.

Mpr Mt Pleasant Hills and Ranges MUL Paroo - Warrego

Mt Pleasant Hills and Ranges landscape includes parts of two land systems: *Euramurtie* and *Mount Pleasant.*

Rounded and partly bevelled ridges on steeply dipping Devonian sandstone and quartzite. Isolated mesa remnants on Tertiary sandstone. Dendritic drainage, relief to 100m. Sand covered footslopes and sandplains with low sandy rises and non-aligned dunes, relief to 20m.

Shallow stony soils on higher areas with belah (*Casuarina cristata*), mulga (*Acacia aneura*), whitewood (*Atalaya hemiglauca*), beefwood (*Grevillea striata*), dead finish (*Acacia tetragonophylla*), emu bush (*Eremophila longifolia*), copperburr (*Sclerolaena* sp.) and kerosene grass (*Aristida contorta*). Moderate mulga with belah on mesa remnants. Footslopes of red desert loams and mantles of silcrete, scattered mulga, bluebush (*Maireana* sp.), dead finish, belah, woollybutt (*Eragrostis eriopoda*), kerosene grass, copperburr and forbs. Red desert loams and coarse sand on lower slopes and drainage lines with rosewood (*Alectryon oleifolius*), whitewood and grasses. River red gum *(Eucalyptus camaldulensis*) with kangaroo grass (*Themeda triandra*) along drainage lines.

Pwa Paroo - Warrego Alluvial Plains MUL Paroo - Warrego

Paroo-Warrego Alluvial Plains landscape includes parts of four land systems: *Cartlands, Colane, Manara* and *Stanbert.*

Level floodplains and broad alluvial plains of Quaternary age with regular, small depressions away from the channel zone, patches of stony plains and low sandy accumulations. Relief 1 to 5m. Brown non-cracking and cracking clays with areas of grey cracking clays and red-brown and yellow texture-contrast soils on plains. Deep sandy red earths with earthy pans, locally scalded on slightly higher ground. Sands and sandy earths on dunes. Depressions of sandy red earths, sometimes with gilgai in grey cracking clays.

Dense clumps of gidgee (*Acacia cambagei*), with mulga (*Acacia aneura*), leopardwood (*Flindersia maculosa*), rosewood (*Alectryon oleifolius*), belah (*Casuarina cristata*) and myall (*Acacia pendula*); scattered warrior bush (*Apophyllum anomalum*), nepine (*Capparis lasiantha*), wild orange (*Capparis mitchellii*), flowering lignum (*Eremophila polyclada*), neverfail (*Eragrostis setifolia*), annual saltbushes (*Atriplex* sp.), rigid panic (*Panicum prolutum*), copperburr (*Sclerolaena* sp.), other grasses and forbs. Coolibah *(Eucalyptus microtheca*), black box *(Eucalyptus largiflorens*), lignum (*Muehlenbeckia cunninghamii*) and annual saltbush on grey clays in channels and channelled floodplain. Depressions rimmed with bimble box *(Eucalyptus populnea*), over tall grasses.

Pwc Paroo - Warrego Channels and Floodouts MUL Paroo - Warrego
Paroo-Warrego Channels and Floodouts landscape includes parts of seven land systems: *Ledknapper, Long Meadow, Nidgery, Paroo, Tongo, Walkdens* and *Warrego.*

Channels, floodplain and dune field islands of alluvium and aeolian sand of Quaternary age, with occasional salinas and extensive scalds along the Paroo and Warrego Rivers, relief to 5m. Channels and floodplain of grey cracking, crab-holey clay. Reddish-brown loamy sands on islands, yellow texture-contrast soils and sands on rises and hummocks.

Coolibah *(Eucalyptus microtheca*), black box *(Eucalyptus largiflorens*), yapunyah *(Eucalyptus ochrophloia*), myall (*Acacia pendula*), river cooba (*Acacia stenophylla*), lignum (*Muehlenbeckia cunninghamii*), canegrass (*Eragrostis australasica*), tall spike rush (*Eleocharis* sp*hacelata*) along channels and fringing depressions. Some brigalow (*Acacia harpophylla*), with lignum, eurah (*Eremophila bignoniflora*), flowering lignum (*Eremophila polyclada*), and cane-grass, nitre goosefoot (*Chenopodium nitrariaceum*), neverfail (*Eragrostis setifolia*), Warrego summer-grass (*Pas*p*alidium jubiflorum*), copperburr (*Sclerolaena* sp.), fairy grass (Sp*orobolus caroli*), and annual saltbushes (*Atriplex* sp.) on grey soils. Islands with open mulga (*Acacia aneura*), sandhill wattle (*Acacia ligulata*), narrow-leaf hopbush (*Dodonaea attenuata*), rosewood (*Alectryon oleifolius*) and bottlewashers (*Enneapogon* sp.). Gidgee (*Acacia cambagei*), belah (*Casuarina cristata*), ironwood (*Acacia excelsa*), turpentine (*Eremophila sturtii*), warrior bush (*Apophyllum anomalum*), budda (*Eremophila mitchellii*), neverfail (*Eragrostis setifolia*), copperburr, and perennial grasses on elevated areas with white cypress pine (*Callitris glaucophylla*) and needlewood (*Hakea leucoptera*) on sandy rises.

Pwh Paroo - Warrego Isolated Hills MUL Paroo - Warrego
Paroo-Warrego Isolated Hills landscape includes parts of three land systems: *Booroondarra, Euramurtie* and *Mount Pleasant.*

Rounded and partly bevelled ridges on steeply dipping Devonian sandstone and quartzite, strike ridges and rocky cliffs, relief to 200m. Isolated mesa remnants on Tertiary sandstone and conglomerate relief to 100m. Dendritic drainage. Sand covered footslopes and sandplains with low sandy rises and non-aligned dunes, relief to 20m.

Shallow stony soils on higher areas with belah (*Casuarina cristata*), mulga (*Acacia aneura*), whitewood (*Atalaya hemiglauca*), beefwood (*Grevillea striata*), dead finish (*Acacia tetragonophylla*), emu bush (*Eremophila longifolia*), copperburr (*Sclerolaena* sp.) and kerosene grass (*Aristida contorta*). Moderate to dense mallee *(Eucalyptus* sp.), currawang (*Acacia doratoxylon*), white cypress pine (*Callitris glaucophylla*), western red box *(Eucalyptus intertexta*), mulga (*Acacia aneura*) and green fuchsia bush (*Eremophila serrulata*) on upper slopes and scarps. Moderate mulga with belah on mesa remnants. Footslopes of red desert loams and mantles of silcrete, scattered mulga, bluebush (*Maireana* sp.), dead finish, belah, woollybutt (*Eragrostis eriopoda*), kerosene grass, copperburr and forbs. Red desert loams and coarse sand on lower slopes and drainage lines with abundant mulga, moderate silver cassia (*Senna artemisiodes*), narrow-leaf wax flower (*Eriostemon*

linearis), rosewood (*Alectryon oleifolius*), whitewood (*Atalaya hemigluaca*) and grasses. White cypress pine and bimble box *(Eucalyptus populnea*) along creeks. River red gum *(Eucalyptus camaldulensis*) with kangaroo grass (*Themeda triandra*) along main drainage lines.

Pwl Paroo - Warrego Linear Dunes MUL Paroo - Warrego

Paroo-Warrego Linear Dunes includes parts of seven land systems: *Copago, Gumbalie, Gumpopla, Klondyke, Minetta, Tiltagoona* and *Wonga Lilli*

Quaternary dunefields with east-west trending dunes, broad swales and small drainage lines, sinks and swamps, relief to 5m, and widely spaced parallel dunes with alluvial corridors and pans, relief to 10m. Also low dunefields with sandy flats.

Deep red clayey sand with earthy pans and sparse mulga (*Acacia aneura*), whitewood (*Atalaya hemiglauca*), forbs and grasses on dunes. Bare scalded alluvial flats with sandy red earths and texture-contrast soils and open mulga (*Acacia aneura*) and shrubs. Crusty brown clays in pans with scattered bimble box *(Eucalyptus populnea*), canegrass (*Eragrostis australasica*), black bluebush (*Maireana pyramidata*) and fringing black box *(Eucalyptus largiflorens*). Calcareous red earths, solonized brown soils, red sands and red sandy earths; scattered to moderate mulga, belah (*Casuarina cristata*) and rosewood (*Alectryon oleifolius*); clumped narrow-leaf hopbush (*Dodonaea attenuata*) and punty bush (*Senna eremophila*); variable speargrass (*Austrostipa variabilis*), cannon-ball (*Sclerolaena paradoxa*), copperburr (*Sclerolaena* sp.) and forbs. Bimble box and black box (including hybrids) with turpentine (*Eremophila sturtii*), prickly wattle (*Acacia victoriae*), canegrass (*Eragrostis australasica*), annual saltbush (*Atriplex* sp.) and bluebush (*Maireana* sp.) in swamps and sinks. Bare scalded alluvial flats with sandy red earths and texture-contrast soils and open mulga and shrubs. Crusty brown clays in pans with canegrass, black bluebush and fringing black box.

Pwp Paroo - Warrego Plains MUL Paroo - Warrego

Paroo-Warrego Plains landscape includes parts of two land systems: *East Toorale* and *Myuna.*

Plains of Quaternary alluvium with poorly defined drainage lines; small drainage sinks and swamps, relief to 5m. Also landscape includes floodouts and low dunes, relief to 2m. Calcareous sandy to loamy red earths, red and brown texture-contrast soils with cracking or plastic grey to brown clays in swamps.

Scattered to dense belah (*Casuarina cristata*), ironwood (*Acacia excelsa*), bimble box *(Eucalyptus populnea*), mulga (*Acacia aneura*), coolibah *(Eucalyptus microtheca*), some gidgee (*Acacia cambagei*), turpentine (*Eremophila sturtii*), budda (*Eremophila mitchellii*), warrior bush (*Apophyllum anomalum*), narrow-leaf hopbush (*Dodonaea attenuata*) on plains. Bimble box, coolibah, bluebush (*Maireana* sp.); cotton bush (*Maireana aphylla*), neverfail (*Eragrostis setifolia*), copperburr (*Sclerolaena* sp.), galvanised burr (*Scleroleana birchii*) and forbs on floodplain, swamps and sinks. Also spotted fuchsia (*Eremophila maculata*), and turpentine (*Eremophila sturtii*) with isolated leafless cherry (*Exocarpus aphyllus*).

Pwg Paroo - Warrego Salt Lakes MUL Paroo - Warrego

Paroo-Warrego Salt Lakes is made up of part of the *Arumpo* and *Cobham* land systems.

Widely distributed saline lakes and clay playas of Quaternary age with bare, flat, crusted floors of salty grey and brown clay. Swamp basins and channels with deep self-mulching brown and grey cracking clays, some with extremely deep and wide cracks. Pans with deep self-mulching brown cracking clays and brown clays with strong surface crusts.

Lignum (*Muehlenbeckia cunninghamii*) and canegrass (*Eragrostis australasica*) with fringing black box *(Eucalyptus largiflorens*), chenopods and prickly wattle (*Acacia victoriae*) on pan

margins with sandy surfaces over earthy pans. Lunettes to 10m, of deep, brown clayey sand with open mulga (*Acacia aneura*), turpentine (*Eremophila sturtii*), pearl bluebush (*Maireana sedifolia*) and forbs and grasses.

Pws Paroo - Warrego Sandplains MUL Paroo - Warrego

Paroo-Warrego Sandplains landscape includes parts of twelve land systems: *Avondale, Denian, Duntroon, Ellerslie, Glenmore, Goonery, Gumbalara, Janina, Oulilla, Trilby, Vidale* and *Waverley*.

Level sandplains of Quaternary age with broad rises. Areas of longitudinal dunes with numerous blowouts, small lakes and few drainage tracts, relief 3 to 8m. Deep calcareous sandy red earths sandy red and yellow texture-contrast on plains and rises with loamy red earths, sandy texture-contrast soils and grey non-cracking clays in depressions and sinks. Dunes with deep red or brown siliceous sands and earthy sands, swales of loamy solonized brown soils with brown cracking clays in pans and swamps.

Dense mallee *(Eucalyptus* sp.) and/or belah (*Casuarina cristata*) and rosewood (*Alectryon oleifolius*) with dense mulga (*Acacia aneura*), bimble box *(Eucalyptus populnea*), gidgee (*Acacia cambagei*), rosewood, white cypress pine (*Callitris glaucophylla*), silver-leaved ironbark *(Eucalyptus melanophloia*), wild lemon (*Canthium oleifolium*), wilga (*Geijera parviflora*), ironwood (*Acacia excelsa*), mulga, sandplain wattle (*Acacia murrayana*), bluebush (*Maireana* sp.), turpentine (*Eremophila sturtii*), narrow-leaf hopbush (*Dodonaea attenuata*), emu bush (*Eremophila longifolia*), budda (*Eremophila mitchellii*), and variable speargrass (*Austrostipa variabilis*) on sandplains and dunes. Swales with moderate to dense belah, rosewood with woollybutt (*Eragrostis eriopoda*), black bluebush (*Maireana pyramidata*), bottlewashers (*Enneapogon* sp.) and variable spear grass. Bimble box, coolibah *(Eucalyptus microtheca*) and black box *(Eucalyptus largiflorens*) with punty bush (*Senna eremophila*), turpentine, lignum (*Muehlenbeckia cunninghamii*), canegrass (*Eragrostis australasica*), eurah (*Eremophila bignoniflora*), and wire grass (*Aristida* sp.) in depressions.

Pwt Paroo - Warrego Tablelands and Downs MUL Paroo - Warrego

Paroo-Warrego Tablelands and Downs landscape includes parts of nine land systems: *Glenhope, Kanimbla, Lansdowne, Nulty* Sp*rings, Nundora, Oakvale, Petita, Pirillie* and *Womparley*.

Rounded low hills and ridges, stony plains of Cretaceous and Tertiary silicified shale, sandstone, conglomerate, and quartzite with sand dunes, hummocks, pans and incised drainage lines, relief 5 to 50m. Defined dendritic drainage, small lakes and occasional overlying sand dune. Shallow, stony loamy soils grading into red earths in drainage tracts and grey and brown clays in depressions. Contour banding of stony red desert loams and self-mulching clays. Reds siliceous sands and sandy earths in dunes, grey self-mulching clays in depressions.

Rocky slopes support supplejack (*Ventilago viminalis*), whitewood (*Atalaya hemiglauca*), western bloodwood (*Corymbia terminalis*), bimble box *(Eucalyptus populnea*), beefwood (*Grevillea striata*), mulga (*Acacia aneura*), umbrella mulga (*Acacia brachystachya*), leopardwood (*Flindersia maculosa*), thorny saltbush (*Rhagodia* sp*inescens*), shrubby rice flower (*Pimelea microcephala*), warrior bush (*Apophyllum anomalum*), green hopbush (*Dodonaea petiolaris*), silver cassia (*Senna artemisiodes*), budda (*Eremophila mitchellii*), climbing saltbush (*Einadia nutans*), silky bluebush (*Maireana villosa*), leopardwood, turpentine (*Eremophila sturtii*), prickly wattle (*Acacia victoriae*), harlequin fuchsia bush (*Eremophila duttonii*) with bottlewashers (*Enneapogon* sp.), copperburr (*Sclerolaena* sp.) and grasses. Low dunes with silver-leaved ironbark *(Eucalyptus melanophloia*), coolibah apple (*Angophora melanoxylon*) and quinine bush (*Alstonia constricta*). Bimble box, cotton bush

(*Maireana aphylla*), black bluebush (*Maireana pyramidata*), copperburr and grasses in swampy depressions.

Meso: MUL Urisino

Usa Urisino Alluvial Plains MUL Urisino

Urisino Alluvial Plains landscape includes parts of three land systems: *Colane, Sturt* and *Yancannia.*

Severely scalded plains of Quaternary alluvium with ill-defined drainage lines. Sandy red earths and loose yellowish-red loamy sands overlying earthy pans, loose sand cover. Small depressions away from channel zone.

Floodouts with canegrass (*Eragrostis australasica*) and black box *(Eucalyptus largiflorens*), and channel zones with dense river red gum *(Eucalyptus camaldulensis*), coolibah *(Eucalyptus microtheca*), river cooba (*Acacia stenophylla*) and abundant perennial grasses. Scattered mulga (*Acacia aneura*) and bimble box *(Eucalyptus populnea*), areas of dense woody shrubs over grasses and forbs. Pans of sandy red earths, sometimes with gilgai in grey cracking clays; rimmed with bimble box, sparse grasses and forbs. Channels broad and shallow, of red earthy sands, locally with deep white sandy drifts supporting a gallery community of bimble box, over tall grasses and forbs.

Usl Urisino Linear Dunes MUL Urisino

Urisino Linear Dunes landscape includes parts of three land systems: *Border, Gumpopla* and *Wonga.*

Widely spaced parallel dunes of Quaternary age with alluvial corridors and pans, relief to 10m. Also low dunefields with sandy flats. Deep red clayey sand with earthy pans and sparse mulga (*Acacia aneura*), whitewood (*Atalaya hemiglauca*), forbs and grasses on dunes. Bare scalded alluvial flats with sandy red earths and texture-contrast soils and open mulga and shrubs. Crusty brown clays in pans with scattered bimble box *(Eucalyptus populnea*), canegrass (*Eragrostis australasica*), black bluebush (*Maireana pyramidata*) and fringing black box *(Eucalyptus largiflorens*).

Uss Urisino Sandplains MUL Urisino

Urisino Sandplains landscape includes parts of two land systems: *Reola* and *Waverley.*

Extensive slightly undulating sandplain of Quaternary aeolian sand with broad dendritic drainage pattern. Sandy alkaline red earths with earthy pans, locally scalded, relief to 5m. Deep sandy to sandy loam red earths with well formed groves of dense mulga (*Acacia aneura*) with ironwood (*Acacia excelsa*) and bimble box *(Eucalyptus populnea*) on sandplain slopes. Trees become continuous along the drainage tracts. Isolated swamps of grey and brown clay ringed by black box *(Eucalyptus largiflorens*) with lignum (*Muehlenbeckia cunninghamii*) on the floors. Also, small depressions of cracking red clayey soils, abundant perennial grasses and forbs.

Ust Urisino Tablelands and Downs MUL Urisino

Urisino Tablelands and Downs landscape includes parts of three land systems: *Petita, Pulgamurtie* and *Womparley.*

Dissected rolling stony tablelands on Cretaceous sandstone with breakaways, relief to 40m. Includes stony plains to low hills on Tertiary silcrete, relief to 10m. Brown lithosols and deeper red desert loams with red clays in gilgai depressions on lower slopes. Shallow reddish-brown desert loams, commonly obscured by drifts of red sands.

Boulders and stones on ridge crests with loamy lithosols and mulga (*Acacia aneura*), dead finish (*Acacia tetragonophylla*), desert poplar (*Codonocarpus cotinifolius*), silver cassia (*Senna artemisiodes*), turkey bush (*Eremophila* sp.), three-winged bluebush (*Maireana triptera*), grasses and copperburr (*Sclerolaena* sp.). Mulga, western bloodwood (*Corymbia terminalis*), desert poplar, silver cassia (*Senna artemisiodes*), narrow-leaf hopbush (*Dodonaea attenuata*), and grasses on the plateau. Poorly developed contour banding on lower slopes, mulga groves and bimble box *(Eucalyptus populnea*) in major drainage lines. Bladder saltbush (*Atriplex vesicaria*), black bluebush (*Maireana pyramidata*), prickly wattle (*Acacia victoriae*), and grasses elsewhere.

Meso: MUL White Cliffs

Wca White Cliffs Alluvial Plains MUL White Cliffs

White Cliffs Alluvial Plains landscape includes parts of eight land systems: *Allandy, Caloola, Colane, Conservation, Fowlers, Sturt, Yancannia* and *Yapunyah.*

Extensively scalded alluvial flats, terminal floodplains with pans and gilgai Broad alluvial plains with regular, small depressions away from channel zone. Relief to 1m. Brown clays with stony surface on floodplains, loamy surfaced brown texture-contrast soils and brown clays, both with strong surface crusts, deep self-mulching brown and grey cracking clays saline calcareous and gypseous at variable depths. Extensive grasslands of neverfail (*Eragrostis setifolia*), Mitchell grasses (*Astrebla* sp.), with dark roly-poly (*Sclerolaena muricata*), cottonbush (*Maireana aphylla*), canegrass (*Eragrostis australasica*) and annual saltbushes (*Atriplex* sp.). Sparse mulga (*Acacia aneura*), whitewood (*Atalaya hemiglauca*), prickly wattle (*Acacia victoriae*), bushy groundsel (*Senecio cunninghamii*), and thorny saltbush (*Rhagodia* sp*inescens*). Rare dunes with mulga. Canegrass, bimble box *(Eucalyptus populnea*), and fringing black box *(Eucalyptus largiflorens*), on pans. Fringing river red gum *(Eucalyptus camaldulensis*) and bimble box along channels. Prickly wattle, scattered bladder saltbush (*Atriplex vesicaria*), yapunyah *(Eucalyptus ochrophloia*), scattered eurah (*Eremophila bignoniiflora*) and flowering lignum (*Eremophila polyclada*) in floodouts.

Wcs White Cliffs Sandplains MUL White Cliffs

White Cliffs Sandplains landscape is made up of part of the *Rodges* land system.

Quaternary sandplains and alluvial plains with low sandy rises, relief to 3m. Sandy calcareous red earths and texture-contrast soils on the plains with open mulga (*Acacia aneura*), shrubs and grasses. Brown clays with strong surface crusts on alluvial plains with belah (*Casuarina cristata*), cabbage-tree wattle (*Acacia cana*), leopardwood (*Flindersia maculosa*), turpentine (*Eremophila sturtii*) and grasses. Pans of texture-contrast soils with calcareous subsoils with lignum (*Muehlenbeckia cunninghamii*) canegrass (*Eragrostis australasica*) and fringing black box *(Eucalyptus largiflorens*).

Wct White Cliffs Tablelands and Downs MUL White Cliffs

White Cliffs Tablelands and Downs landscape includes parts of fourteen land systems: *Flat Top, Glenhope, Katalpa, Nundora, Oakvale, Pelita, Pirillie, Pulchra, Pulgamurtie, Purnanga, Quarry View, Questa Park, Womparley* and *Wongal.*

Extensive gently undulating stony plateau escarpment, slopes and drainage lines on horizontal Cretaceous sandstone, mudstone and Tertiary silcrete, relief more than 30m. Partly obscured by sandplain and associated floodplains with extensive scalded areas, relief to 2m. Mainly shallow acidic reddish-brown lithosols and reddish-brown sandy earths. Small areas of deeper desert loams with shallow gilgai. Contour bands of stone-free red cracking clays and stony red desert loams with hardpans. Floodplains with grey cracking clays and large areas of yellow and red-brown texture-contrast soils.

Mulga (*Acacia aneura*), western bloodwood (*Corymbia terminalis*), umbrella mulga (*Acacia brachystachya*), black bluebush (*Maireana pyramidata*), belah (*Casuarina cristata*), rosewood (*Alectryon oleifolius*), leopardwood (*Flindersia maculosa*), desert poplar (*Codonocarpus cotinifolius*), silver cassia (*Senna artemisiodes*), cabbage-tree wattle (*Acacia cana*), narrow-leaf hopbush (*Dodonaea attenuata*) and grasses on the plateau and escarpment. Poorly developed contour banding on lower slopes, mulga groves and bimble box *(Eucalyptus populnea*) in major drainage lines. Floodplains with isolated whitewood (*Atalaya hemiglauca*), river cooba (*Acacia stenophylla*), gidgee (*Acacia cambagei*), coolibah *(Eucalyptus microtheca*), three-winged bluebush (*Maireana triptera*), lignum (*Muehlenbeckia cunninghamii*), neverfail (*Eragrostis setifolia*), Mitchell grass (*Astrebla* sp.), rigid panic (*Panicum prolutum*), annual saltbushes (*Atriplex* sp.), bladder saltbush (*Atriplex vesicaria*), black bluebush (*Maireana pyramidata*), bottlewasher (*Enneapogon* sp.) and streaked-poverty bush (*Sclerolaena tricuspis*). Drainage lines support belah, rosewood and some river red gum *(Eucalyptus camaldulensis*).

NAN - Descriptions for Landscapes in the Nandewar Bioregion

Meso: NAN Ashford

Ask Ashford Karst NAN Ashford

Steep rocky hills and open valley on Permo-Carboniferous massive limestone with karst features of caves and sinkholes. Folded and faulted limestone outcrop structurally controlled. General elevation 500m, local relief 50 to 80m. Thin, dark, alkaline, pedal clays on limestone, brown gritty texture-contrast soils on adjacent slopes on lithic sandstones, hornfels and granite. Woodland with; white box (*Eucalyptus albens*), inland grey box (*Eucalyptus microcarpa*), and kurrajong (*Brachychiton populneus*) on the limestone.

Ash Ashford Mole Valleys NAN Ashford

Wide valleys and low rolling hills on gently dipping Permo-Carboniferous lithic sandstones, mudstones, conglomerate and some tuffaceous sediments. General elevation 300 to 400m, local relief 75m. Rock outcrop with thin sands on upper slopes. Uniform to gradational yellow loamy sands and yellow texture-contrast soils on shale benches, lower slopes and valley floors. Woodland species include; tumbledown red gum (*Eucalyptus dealbata*), Caley's ironbark (*Eucalyptus caleyi*) and black cypress pine (*Callitris endlicheri*) on rocky ridges, narrow-leaved ironbark (*Eucalyptus crebra*) and orange gum (*Eucalyptus prava*) on slopes, yellow box (*Eucalyptus melliodora*) and rough-barked apple (*Angophora floribunda.*) on floodplains with river oak (*Casuarina cunninghamiana*) along the stream banks.

Ber Bebo Ranges and Slopes NAN Ashford

Moderately steep, rocky ranges with tor covered peaks and low angle coarse sand debris slopes with boulders on Permian granite. Cut by deep gorges of major streams, general elevation 400 to 760m, local relief 250m. Gritty shallow uniform profiles merging to tallow harsh red and yellow texture-contrast soils that are prone to gully development on lower slopes. Granite peaks have locally endemic joint crevice heath communities. Woodland of tumbledown red gum (*Eucalyptus dealbata*), black cypress pine (*Callitris endlicheri*), red ironbark (*Eucalyptus sideroxylon*), narrow-leaved ironbark (*Eucalyptus crebra*) with a variety of shrubs such as silver wattle (*Acacia dealbata*) and cough bush (*Cassinia laevis*) and sparse grasses. Poorly drained alluvium on valley floors with silver-leaved ironbark (*Eucalyptus*

melanophloia) and bull oak (*Allocasuarina luehmannii*). Small areas of dry closed forest in protected sites.

Duc Dumaresq Channels NAN Ashford

Channel, floodplain and terraces of the Dumaresq River on Quaternary sands and gravels. General elevation 300 to 400m, local relief 25m. Undifferentiated sand and loamy sand alluvium. Gallery forest of mixed river red gum (*Eucalyptus camaldulensis*), river oak (*Casuarina cunninghamiana*) with understorey of weeping bottle brush (*Callistemon viminalis*), and river paperbark (*Melaleuca trichostachya*) with spiny-headed matt rush (*Lomandra longifolia*), tall sedge (*Carex appressa*), and giant sedge (*Cyperus exaltatus*).

Dug Dumaresq Gorges NAN Ashford

Steep rocky slopes with massive outcrop and tor topography of gorges cut through Permian granite of the Bebo Range Landscape. Rapids in the Severn River. General elevation 400 to 480m, local relief 80m. Abundant rock outcrop with thin uniform coarse sands and clayey sand between boulders. Coarse sands and massive boulders in stream beds. Sparse to dense stunted woodland of; tumbledown red gum (*Eucalyptus dealbata*), white cypress pine (*Callitris glaucophylla*), black cypress pine (*Callitris endlicheri*), Port Jackson fig (*Ficus rubiginosa*) with river oak (*Casuarina cunninghamiana*) along the stream banks.

Mov Mole Valley NAN Ashford

Channel, floodplain and terraces of the Mole River on Quaternary alluvium below lower Permian conglomerate, lithic sandstone and minor siltstone. General elevation 370 to 600m, local relief 30m. Sand and loamy sand on the floodplain, gradational sandy loam on terraces. River oak (*Casuarina cunninghamiana*) and some river red gum (*Eucalyptus camaldulensis*) along the streams, rough-barked apple (*Angophora floribunda*) and yellow box (*Eucalyptus melliodora*) on the floodplain and terrace remnants.

Meso: NAN Inverell

Inb Inverell Basalts NAN Inverell

Undulating low hills of the New England Plateau on extensive basalt flows of a Tertiary lava field. Sub-basaltic sands and gravels exposed at the edges of the flows. General elevation 450 to 900m, local relief 20 to 50m. Long hill slopes are stepped across different lava flows and have a marked break of slope where buried sands and gravels are exposed Black structured loam and clay thickening down slope to dense sticky black clay in drainage lines. Most basalt soils have high nutrient levels and good water holding capacity. Exposed Tertiary sands have coarse sandy soils that may develop podsol pans. Upper slopes with woodland to open forest of; white box (*Eucalyptus albens*), silver-leaved ironbark (*Eucalyptus melanophloia*), red ironbark (*Eucalyptus sideroxylon*). Lower slopes; yellow box (*Eucalyptus melliodora*), rough-barked apple (*Angophora floribunda*), Blakely's red gum (*Eucalyptus blakelyii*). Manna gum (*Eucalyptus viminalis*) in valleys and around ridge top rock outcrops with occasional snow gum (*Eucalyptus pauciflora*). River oak (*Casuarina cunninghamiana*) along all streams.

Ins Inverell Plateau Slopes NAN Inverell

Moderately steep hills and slopes with strong development of western drainage on the margin of the Inverell Basalts landscape. Mixed zone of Tertiary basalt and colluvial and alluvial debris derived from basalt with some exposure of underlying Permian granite and Palaeozoic and Mesozoic sandstones. General elevation 500 to 700m, local relief 50 to 80m. Basalts develop gradational structured loam profiles that thicken down slope and merge with dark clay on valley floors. Soils on sedimentary rocks and granite are red to yellow uniform or gradational earthy sand with occasional yellow texture-contrast soils on lower slopes. Woodland of; white box (*Eucalyptus albens*), silver-leaved ironbark (*Eucalyptus melanophloia*), red ironbark (*Eucalyptus sideroxylon*), Caley's ironbark (*Eucalyptus caleyi*),

grading to lower slopes with yellow box (*Eucalyptus melliodora*), rough-barked apple (*Angophora floribunda*), Blakely's red gum (*Eucalyptus blakelyii*) and white cypress pine (*Callitris glaucophylla*). River oak (*Casuarina cunninghamiana*) and occasional river red gum (*Eucalyptus camaldulensis*) along the streams.

Meso: NAN Kaputar

Bsa Belata Sands NAN Kaputar
Westward sloping plains and downs with ephemeral creek channels on Tertiary poorly cemented gravels, sand and clay. General elevation 220 to 260m, local relief <10m. Red-brown to red-yellow earths uniform or gradational profiles. Belah (*Casuarina cristata*) woodlands with grasses and patches of bimble box (*Eucalyptus populnea*).

Kpf Kaputar Hill Crest Flows and Sands NAN Kaputar
Remains of a Tertiary central volcano with a thick sequence of basaltic lavas. Benched slopes mark different lava flows. General elevation 500 to 1000m, local relief 250m. Frequent rock outcrop interspersed with shallow stony brown loams. Black earth on lower slopes and valleys. Silver-topped stringybark (*Eucalyptus laevopinea*), mountain gum (*Eucalyptus dalrympleana*), broad-leaved stringybark (*Eucalyptus caliginosa*), black cypress pine (*Callitris endlicheri*), white cypress pine (*Callitris glaucophylla*), silver-leaved ironbark (*Eucalyptus melanophloia*), narrow-leaved ironbark (*Eucalyptus crebra*), red stringybark (*Eucalyptus macrorhyncha*), tumbledown red gum (*Eucalyptus dealbata*), Dwyer's mallee gum (*Eucalyptus dwyeri*) and patches of mallee and heath on stony ridges.

Kps Kaputar Slopes NAN Kaputar
Lower slopes of the Kaputar volcanic complex with radiating finger-like ridges capped by basalt over lower Permian and Triassic quartz sandstone, lithic sandstone, silty sandstone, conglomerate and thin coal measures. General elevation 300 to 500m, local relief 80m. Shallow stony red-brown loam and clay loam in uniform profiles on basalt, yellow and yellow-brown texture-contrast profile on sandstone, deep black earths in lowest valleys. Kurrajong (*Brachychiton populneus*), yellow box (*Eucalyptus melliodora*), white box (*Eucalyptus albens*), rough-barked apple (*Angophora floribunda*) and Blakely's red gum (*Eucalyptus blakelyii*) on lower slopes and valleys.

Kpt Kaputar Tops NAN Kaputar
Rugged steep rocky hills and peaks, exposed volcanic plugs and dykes of trachyte of the Tertiary Kaputar volcano. Elevation 1000 to 1510m, local relief 400m. Thin stony brown structured loams. Snow gum (*Eucalyptus pauciflora*) and manna gum (*Eucalyptus viminalis*), on the highest tops with silvertop stringybark (*Eucalyptus laevopinea*), mountain gum (*Eucalyptus dalrympleana*), broad-leaved stringybark (*Eucalyptus caliginosa*), rough-barked mountain gum (*Eucalyptus* aff. *Cypellocarpa*) and diverse heaths. Small areas of dry rainforest in sheltered locations.

Meso: NAN Peel

Atk Attunga Karst NAN Peel
Limited areas middle Devonian steep dipping massive limestones with some karst features. General elevation 400m, local relief 50 to 100m. Dark, alkaline, pedal uniform or gradational clay. Open woodland of white box (*Eucalyptus albens)*, rough-barked apple (*Angophora floribunda*), lightwood (*Acacia implexa*), cooba (*Acacia salicina*) and Port Jackson fig (*Ficus rubiginosa*).

Bwm Baldwin Mountains NAN Peel

Steep asymmetric ranges on shallow dipping Devonian sandstone, conglomerate and mudstone. General elevation 450 to 890m, local relief 300m. Extensive rock outcrop on the edge of benches defined by bedding, thin stony loam, with occasional development of red-yellow texture-contrast profiles over mudstone units. Deeper gradational and stony texture-contrast soils on slope aprons. No specific vegetation information is available, expected species include; tumbledown red gum (*Eucalyptus dealbata*), black cypress pine (*Callitris endlicheri)*, ironbarks (*Eucalyptus* spp.) and stringybarks (*Eucalyptus* spp.).

Gph Gap Hills NAN Peel

Moderately steep asymmetric range on shallow dipping Carboniferous conglomerate, lithic sandstone, tuff and interbedded volcanics. General elevation 400 to 690m, local relief 200m. Extensive rock outcrop, thin stony loam, with occasional development of red-yellow texture-contrast profiles. Deeper gradational and stony texture-contrast soils on slope aprons. No specific vegetation information is available, expected species include; tumbledown red gum (*Eucalyptus dealbata*), black cypress pine (*Callitris endlicheri)*, ironbarks (*Eucalyptus* spp.) and stringybarks (*Eucalyptus* spp.).

Kvr Kelvin Range NAN Peel

Steep ranges with wide debris aprons on moderately dipping Carboniferous sandstone, conglomerate, rhyodacite and tuff. General elevation 300 to 890m, local relief 500m. Shallow stony sandy loam on ridges and slopes, texture-contrast in rubbly debris on the colluvial apron shifting in colour from red brown on upper slopes to yellow on lower slopes. No specific vegetation information is available, expected species include; tumbledown red gum (*Eucalyptus dealbata*), black cypress pine (*Callitris endlicheri)*, ironbarks (*Eucalyptus* spp.) and stringybarks (*Eucalyptus* spp.) on the slopes grading to white cypress pine (*Callitris glaucophylla*), white box (*Eucalyptus albens*) and western species on the lower slopes.

Nun Nundle Hills NAN Peel

Complex of rounded steep hills on faulted steep dipping Devonian-Carboniferous felspathic sandstone, mudstone and conglomerate. General elevation 450 to 1130m, local relief 300m. Yellow harsh texture-contrast soils with uniform loam along valley floors Woodland of; white box (*Eucalyptus albens*), red stringybark (*Eucalyptus macrorhyncha*), yellow box (*Eucalyptus melliodora*), Blakely's red gum (*Eucalyptus blakelyii*), with red ironbark (*Eucalyptus sideroxylon*) on stony crests, mountain gum (*Eucalyptus dalrympleana*) on floodplains, river oak (*Casuarina cunninghamiana*) and some river red gum (*Eucalyptus camaldulensis*) along the stream banks. Hilly areas with woodland of; broad-leaved stringybark (*Eucalyptus caliginosa*), Youman's stringybark (*Eucalyptus youmanii*), white box (*Eucalyptus albens*), orange gum (*Eucalyptus prava*), red ironbark (*Eucalyptus sideroxylon*), black cypress pine (*Callitris endlicheri*) and yellow box (*Eucalyptus melliodora*).

Pef Peel Channels and Floodplain NAN Peel

Channel, floodplain, swamps, lagoons and terrace remnants on Quaternary alluvium, general elevation 300 to 550m, local relief 20m. Downstream of Attunga the river is incised across the geological structure. River oak (*Casuarina cunninghamiana*) in higher sectors of the channel merging with river red gum (*Eucalyptus camaldulensis*) as the floodplain widens. Rough-barked apple (*Angophora floribunda*) and yellow box (*Eucalyptus melliodora*) on the floodplain.

Slp Slippery Rock Range NAN Peel

Steep structurally controlled linear ranges on moderately steep dipping folded Carboniferous lithic sandstone, conglomerate, and interbedded acid and intermediate volcanics. The main ridge and peaks are formed by a resistant andesite unit. General elevation 500 to 930m, local relief 350m. Shallow stony sandy loam on ridges, benches and slopes, texture-contrast on some benches and on rubbly debris on the colluvial apron, red-brown on upper slopes and yellow on lower slopes. No specific vegetation information is available, expected species

include; Blakely's red gum (*Eucalyptus blakelyii*), orange gum (*Eucalyptus prava*), tumbledown red gum (*Eucalyptus dealbata*), black cypress pine (*Callitris endlicheri*), ironbarks (*Eucalyptus* spp.) and stringybarks (*Eucalyptus* spp.) on the slopes grading to white cypress pine (*Callitris glaucophylla*), white box (*Eucalyptus albens*) and western species on the lower slopes. Manna gum (*Eucalyptus viminalis*) and possibly snow gum (*Eucalyptus pauciflora*) on highest peaks.

Spy Split Yard Plateau NAN Peel

Complex ranges and steep sided peaks on folded and faulted Devonian and Carboniferous conglomerate, sandstone, mudstone, andesite and tuff. The main range has a central valley within a synclinal fold and the high peaks are formed by a rhyodacite unit. General elevation 600 to 910m, local relief 200m. Shallow stony sandy loam on ridges, stony gradational loam and red-yellow texture-contrast on lower slopes. No specific vegetation information is available, expected species include; Blakely's red gum (*Eucalyptus blakelyii*), orange gum (*Eucalyptus prava*), tumbledown red gum (*Eucalyptus dealbata*), black cypress pine (*Callitris endlicheri*), ironbarks (*Eucalyptus* spp.) and stringybarks (*Eucalyptus* spp.) on the slopes grading to white cypress pine (*Callitris glaucophylla*), white box (*Eucalyptus albens*) and western species on the lower slopes. Manna gum (*Eucalyptus viminalis*) and possibly snow gum (*Eucalyptus pauciflora*) on highest peaks.

Tmw Tamworth - Keepit Slopes and Plains NAN Peel

Extensive area of undulating to rolling slopes and plains with low hills and low ranges forming the western fall of the New England plateau. Complex geology of folded and faulted sedimentary and metamorphic rocks with minor interbedded volcanics. Rock types include; Silurian-Devonian chert, slate, phyllite, tuff, schist and Carboniferous conglomerate, sandstone, mudstone, andesite and small areas of limestone. General elevation 500 to 800m, local relief 250m, with some peaks reaching 1100m. Shallow stony soils on ridges. Texture-contrast soils on almost all slopes shifting in colour from red-brown on upper slopes to yellow with harsh subsoils prone to gully development on lower slopes. White box (*Eucalyptus albens*) grassy woodlands, with yellow box (*Eucalyptus melliodora*), Blakely's red gum (*Eucalyptus blakelyii*), cooba (*Acacia salicina*) and lightwood (*Acacia implexa*) on lower slopes. Rough barked apple (*Angophora floribunda*) and yellow box (*Eucalyptus melliodora*) on flats. River oak (*Casuarina cunninghamiana*) along major streams with river red gum (*Eucalyptus camaldulensis*) increasing to the west. Patches of red stringybark (*Eucalyptus macrorhyncha*) and red ironbark (*Eucalyptus sideroxylon*) on steeper slopes in the east.

Nee The Needles Basalt Peaks NAN Peel

Steep conical mountain peaks linked by steep structurally controlled ridges on Tertiary quartz dolerite intrusive volcanic rock. General elevation 450 to 940m, local relief 350m. No specific soils or vegetation information is available. Soils are expected to be stony brown structured loam and clay loam. Vegetation species expected include; white box (*Eucalyptus albens*), Blakely's red gum (*Eucalyptus blakelyii*), orange gum (*Eucalyptus prava*), tumbledown red gum (*Eucalyptus dealbata*), black cypress pine (*Callitris endlicheri*), ironbarks (*Eucalyptus* spp.) and stringybarks (*Eucalyptus* spp.) on the slopes. Manna gum (*Eucalyptus viminalis*) and possibly snow gum (*Eucalyptus pauciflora*) on highest peaks. Patches of dry closed forest and rainforest understorey species such as figs (*Ficus* spp.) are likely.

Uga Upper Gwydir Channels and Floodplain NAN Peel

Narrow channel, floodplain and terrace remnants of the Gwydir River and tributaries in its headwaters on the New England plateau and crossing the western slopes. General elevation300 to 800m, local relief nominal 20 to 40m. River oak (*Casuarina cunninghamiana*) along the banks at higher elevation merging with river red gum (*Eucalyptus camaldulensis*) at lower levels. Rough-barked apple (*Angophora floribunda*), white box (*Eucalyptus albens*) and yellow box (*Eucalyptus melliodora*) on the floodplain.

Wck Werris Creek Basalt Hills and Valleys NAN Peel

Undulating plain with low hills on gently folded lower Permian basalt, tuff and tuffaceous sandstone, general elevation 500 to 550m, local relief 30 to 50m. Brown and red brown gradational structured loam and clay loam merging with black sticky clay along streamlines. Profiles thicken down slope and are of moderate fertility. White box (*Eucalyptus albens*) grassy woodland originally widespread, now much cleared. Forest red gum (*Eucalyptus tereticornis*), red stringy bark (*Eucalyptus macrorhyncha)* and black cypress pine (*Callitris endlicheri*) on slopes. River red gum (*Eucalyptus camaldulensis*) along streams.

Wds Woods Reef Serpentinite NAN Peel

Steep stony hills along a linear outcrop of lower Permian serpentinite and associated basic and ultrabasic intrusive rocks, general elevation 500 to 930m, local relief 200 to 350m. the serpentinites have shallow stony profiles with concentrations of elements that are toxic to many plants. Vegetation communities on these sites are always different from adjacent areas but little work has been done. Known species include; a grassy woodland with an undescribed stringybark (*Eucalyptus* spp.) similar to red stringybark (*Eucalyptus macrorhyncha*), rough-barked apple (*Angophora floribunda*), white cypress pine (*Callitris glaucophylla*), lightwood (*Acacia implexa*), kangaroo thorn (*Acacia paradoxa*), northern silver wattle (*Acacia leucoclada*), grass tree *Xanthorrhoea glauca*, and *Triodia scariosa* on northern slopes. Undescribed species of; *Homopholis* spp., *Hovea* spp., *Callistemon* spp., *Dianella* spp., *Minuria* spp., *Glycine* spp. and *Brachycome* spp., are known to be present.

NET - Descriptions for Landscapes in the New England Tablelands Bioregion

Meso: NET Armidale

Dsm Dingo Spur Meta-sediments NET Armidale

Steep ranges and hills intersected by a dendritic drainage pattern leading into deep gorges with high waterfalls on the Great Escarpment, extends west onto the tablelands. Gorges incised into faulted, steep dipping Devonian quartzose sandstone, greywacke, massive argillite and slate. Tablelands area on Permo-Carboniferous mudstone, lithic sandstone, tuff, slate, hornfels and some schist. General elevation 300 to 1400m, local relief 600m. Shallow stony loam on steep scree slopes with moderate organic content. Shallow gradational loam and sandy loam elsewhere with deeper uniform profiles in low valleys. A very complex vegetation environment encompassing coastal closed forests, dry hardwood forests and cold high plateau components. Open forest of New England blackbutt (*Eucalyptus andrewsii* ssp. *campanulata)*, messmate (*Eucalyptus obliqua*), silvertop stringybark (*Eucalyptus laevopinea*) with New England peppermint (Eucalyptus *cinerea*), snow gum (*Eucalyptus pauciflora*) and black sallee (*Eucalyptus stellulata*) in high cool environments. Dry closed forest species such as; shatterwood (*Backhousia sciadophora)*, giant stinging tree (*Dendrocnide excelsa*), shiny-leaved stinging tree (*Dendrocnide photinophylla*), and yellow tulip (*Drypetes australasica*) in lower moister environments and in patches on scree slopes where protected from fire. River oak (*Casuarina cunninghamiana*) along all streams and dry hardwood forests of; yellow box (*Eucalyptus melliodora*), Blakely's red gum (*Eucalyptus blakelyii*), broad-leaved stringybark (*Eucalyptus caliginosa*) and cabbage gum (*Eucalyptus amplifolia*) on valley floors.

Meso: NET Basalts

Etb Ebor Tops Basalt NET Basalts

Hilly benched plateau with deeply dissected margin formed on Tertiary basalt with minor trachyte. General elevation 1200 to 1500m, local relief 150m. Highest and steepest above the Great Escarpment with 2000mm rainfall. Deep brown to red-brown well structured loams with high organic content. Stony profiles on trachyte. Waterlogged clayey peat in some valleys. Snow gum (*Eucalyptus pauciflora*), black sallee (*Eucalyptus stellulata*) woodland with New England peppermint (*Eucalyptus cinerea*), messmate (*Eucalyptus obliqua*), manna gum (*Eucalyptus viminalis*), shining gum (*Eucalyptus nitens*), and brown barrel (*Eucalyptus fastigata*). Sphagnum (*Sphagnum cristatum*) peat, New England mallee ash (*Eucalyptus approximans*) heaths on siliceous soils.

Gsb Glenn Innes - Guyra Basalts NET Basalts
Undulating to stepped hilly plateau with broad ridges, wide shallow valleys and high rounded peaks on Tertiary basalt, general elevation 700 to 1510m, local relief 300m, average level of the landscape 1300m. Brown structured stony loam and clay loam, on slopes, occasional red structured loam with gradational profiles and deep dark self-mulching sticky clay on the valley floors. Open woodland with snow gum (*Eucalyptus pauciflora*), black sallee (*Eucalyptus stellulata*), manna gum (*Eucalyptus viminalis*), silvertop stringybark (*Eucalyptus laevopinea*), and New England peppermint (*Eucalyptus cinerea*) in higher areas grading to woodland of white box (*Eucalyptus albens*), yellow box (*Eucalyptus melliodora*), rough-barked apple (*Angophora floribunda*) with manna gum (*Eucalyptus viminalis*) along streams in lower areas. Extensive grassy understorey.

Meso: NET Glenn Innes - Guyra Lake Basins

Gls Guyra Lagoons and Swamps NET Glenn Innes - Guyra Lake Basins
Closed drainage basins forming shallow swamps and lagoons on the Guyra plateau. Some form on Tertiary basalt and others appear to be deflation basins in granite. Most have a low clayey lunette on the eastern margin. General elevation 1300 to 1400m, local relief <10m. Water levels vary over decades, and some drainage works have been undertaken but the lagoons are mostly permanent and support aquatic plants such as tall spike rush and sedges. Snow gum (*Eucalyptus pauciflora*) woodlands on the lunettes with occasional mountain gum (*Eucalyptus dalrympleana*), wattle-leaved peppermint (*Eucalyptus nicholii*), New England peppermint (*Eucalyptus cinerea*) and silver wattle (*Acacia dealbata*).

Meso: NET Granites

Etg Ebor Tops Granite NET Granites
Benched plateau with rounded low hills and swampy valleys on Permian granite and granodiorite. General elevation 100 to 1600m, local relief 350m. Domed rock outcrop on the peak, shallow uniform siliceous sand grading to yellow and gleyed texture-contrast soils in valleys. Peak and ridges with shrubby open forest of; stunted broad-leaved stringybark (*Eucalyptus caliginosa*), New England blackbutt (*Eucalyptus andrewsii* ssp. *andrewsii*), wattle-leaved peppermint (*Eucalyptus nicholii*), narrow-leaved peppermint (*Eucalyptus radiata*), mountain gum (*Eucalyptus dalrympleana*). Forest of messmate (*Eucalyptus obliqua*) and manna gum (*Eucalyptus viminalis*) in sheltered valleys with cool temperate closed forest species. Mountain gum (*Eucalyptus dalrympleana*), apple box (*Eucalyptus bridgesiana*), New England peppermint (*Eucalyptus cinerea*) and snow gum (*Eucalyptus pauciflora*) above sedgeland and wet heath in wide valleys.

Gtg Guyra Tops Granite NET Granites
Undulating high plains and rounded peaks on Permian granite, granodiorite and other intrusive rocks that form the substrate for, and surround the Glenn Innes - Guyra Basalt landscape. General elevation 1300 to 1480m, local relief 250m. Gritty yellow texture-contrast soils. Woodland and open forest of; New England peppermint (*Eucalyptus cinerea*), snow gum (*Eucalyptus pauciflora*), black sallee (*Eucalyptus stellulata*), Blakely's red gum

(*Eucalyptus blakelyii*), narrow-leaved black peppermint (*Eucalyptus nicholii*) and mountain gum (*Eucalyptus dalrympleana*).

Ing Inverell Plateau Granites NET Granites

Widely distributed and defined undulating plateau with domed peaks on Permian New England granites and granodiorites. Several intrusions have distinctive contact ridges of metamorphosed sedimentary rocks. The area includes Permian acid volcanics and pyroclastics and some undifferentiated Permo-Carboniferous mudstone and lithic sandstone. General elevation 900 to 1500m, local relief 200m. The highest elevations are along the eastern edge above the Great escarpment, most of the plateau lies ate 900 to 1200m. As mapped this is a large landscape and it might require subdivision on the basis of vegetation. Domed rock outcrop is common with tors. Shallow gritty loam thickens downs lope to red or yellow earthy sand and red, red-yellow and yellow texture-contrast soil on lower slopes and valley floors. Wide valleys may have deep dark clay deposits in swampy streamlines. The vegetation varies with topography, soil, drainage and temperature.

In dry areas open forest of; silvertop stringybark (*Eucalyptus laevopinea*), broad-leaved stringybark (*Eucalyptus caliginosa*), Blakely's red gum (*Eucalyptus blakelyii*), narrow-leaved peppermint (*Eucalyptus radiata*), yellow box (*Eucalyptus melliodora*), apple box (*Eucalyptus bridgesiana*), red ironbark (*Eucalyptus sideroxylon*), Caley's ironbark (*Eucalyptus caleyi*), rough-barked apple (*Angophora floribunda*) and black cypress pine (*Callitris endlicheri*).

In moist areas open forest of; New England peppermint (*Eucalyptus cinerea*), manna gum (*Eucalyptus viminalis*), mountain gum (*Eucalyptus dalrympleana*), New England blackbutt (*Eucalyptus andrewsii* ssp. *campanulata)*, diehard stringybark (*Eucalyptus cameronii*), Deane's gum (*Eucalyptus deanei*), messmate (*Eucalyptus obliqua*), privet-leaved stringybark (*Eucalyptus ligustrina*), Youman's stringybark (*Eucalyptus youmanii*), swamp gum (*Eucalyptus camphora*), Gibraltar rock blackbutt (*Eucalyptus pyrocarpa*), tumbledown red gum (*Eucalyptus dealbata*) and orange gum (*Eucalyptus prava*) sometimes with closed forest species in the understorey especially in the eastern parts of the landscape.

In cold areas snow gum (*Eucalyptus pauciflora*), black sallee (*Eucalyptus stellulata*) woodlands are the norm with manna gum and mountain gum along some streams.

Most granite peaks have specialised joint crevice heath communities typically with about 100 plant genera and almost always containing local endemic species. In this landscape the following communities are recognised; *Gonocarpus teucriodes - Isotoma axillaris* herbfield with black cypress pine, orange gum, tumbledown red gum, Caley's ironbark, and western New England blackbutt. *Babingtonia densifolia - Homoranthus prolixus* shrubland with black cypress pine, orange gum, tumbledown red gum, and *Acacia neriifolia*. New England tea tree - *Brachyloma saxicola* heath on the escarpment of the Gibraltar Range with New England mallee ash (*Eucalyptus approximans)*, diehard stringybark, apple box, forest oak (*Allocasuarina torulosa*), black cypress pine and orange gum.

Mnb Moonbi - Walcha Granites NET Granites

Complex of steep ranges, plateau and rounded peaks with abundant large tors and rock domes on Permian granite, granodiorite and porphyry, general elevation 500 to 1320m, local relief 100 to 300m with the plateau at an average of 1000 to 1150m. Soils vary with rock type, depth of alteration and topographic position. Thin gritty loams near rock outcrop on crests, uniform to gradational earths on gentle slopes and red and yellow texture-contrast profiles in valleys. Vegetation also varies and includes open forest and woodland of; white cypress pine (*Callitris glaucophylla*), white box (*Eucalyptus albens*), Caley's ironbark (*Eucalyptus caleyi*), tumbledown red gum (*Eucalyptus dealbata*), silver-leaved ironbark (*Eucalyptus melanophloia*), yellow box (*Eucalyptus melliodora*), orange gum (*Eucalyptus prava*), silvertop stringybark (*Eucalyptus laevopinea*), western golden wattle (*Acacia decora*), lightwood (*Acacia implexa*), kangaroo thorn (*Acacia paradoxa*), and hickory wattle (*Acacia obliquinervia*) on lower western slopes. *Prostanthera nivea - Acacia viscidula* shrubland

adjacent to rock outcrop with; orange gum, black cypress pine (*Callitris endlicheri*), tumbledown red gum, kurrajong (*Brachychiton populneus*), and Port Jackson fig (*Ficus rubiginosa*).

Meso: NET Sediments and Meta-sediments

Brv Bundarra Valley NET Sediments and Meta-sediments

Rolling hills and the valley of the upper Gwydir River surrounded by ranges in adjacent landscapes on Carboniferous folded greywacke, claystone, chert and basic volcanics, general elevation 650 to 1050m, local relief 200m. Yellow harsh texture-contrast soils with some accumulation of uniform loam along the river floodplain. Central valley and hills woodland of; white box (*Eucalyptus albens*), red stringybark (*Eucalyptus. macrorhyncha*), yellow box (*Eucalyptus melliodora*), Blakely's red gum (*Eucalyptus blakelyii*), with red ironbark (*Eucalyptus sideroxylon*) on stony crests, mountain gum (*Eucalyptus dalrympleana*) on floodplains and river red gum (*Eucalyptus camaldulensis*) along the stream banks. Hilly margins with woodland of; broad-leaved stringybark (*Eucalyptus caliginosa*), Youman's stringybark (*Eucalyptus youmanii*), white box (*Eucalyptus albens*), orange gum (*Eucalyptus prava*), red ironbark, black cypress pine (*Callitris endlicheri*) and yellow box (*Eucalyptus melliodora*).

Meso: NET Walcha

Ams Apsley Meta-sediments NET Walcha

Steep ranges and hills intersected by a dendritic drainage pattern leading into deep gorges with high waterfalls on the Great Escarpment. Gorges incised into faulted, steep dipping Silurian-Devonian and Permian greywacke, claystone, chert, jasper quartzite, schist, phyllite, slate, tuff, basic volcanics and some limestone. General elevation 400 to 1250m, local relief 600m. Shallow stony loam on steep scree slopes with moderate organic content, shallow gradation loam and sandy loam elsewhere. A very complex vegetation environment encompassing coastal closed forests, dry hardwood forests and cold high plateau components. Open forest of New England blackbutt (*Eucalyptus andrewsii* ssp. *campanulata)*, messmate (*Eucalyptus obliqua*), silvertop stringybark (*Eucalyptus laevopina*) with New England peppermint (*Eucalyptus nova-anglica*), snow gum (*Eucalyptus pauciflora*) and black sallee (*Eucalyptus stellulata*) in high cool environments. Narrow-leaved black peppermint (*Eucalyptus cinerea*) and Hillgrove gum (*Eucalyptus michaeliana*) on plateau margins. Dry closed forest species such as; shatterwood (*Backhousia sciadophora)*, giant stinging tree (*Dendrocnide excelsa*), shiny-leaved stinging tree (*Dendrocnide photinophylla*), and yellow tulip (*Drypetes australasica*) in lower moister environments and in patches on scree slopes where protected from fire. River oak (*Casuarina cunninghamiana*) along all streams and dry hardwood forests of; yellow box (*Eucalyptus melliodora*), Blakely's red gum (*Eucalyptus blakelyii*), broad-leaved stringybark (*Eucalyptus caliginosa*) and cabbage gum (*Eucalyptus amplifolia*) on low valley floors.

Nia Niangala Plateau and Slopes NET Walcha

High rolling plateau on steeply dipping Devonian slate, phyllite, tuff, sandstone, conglomerate, chert and jasper, faulted Permian conglomerate, sandstone and mudstone, Carboniferous sandstone, slate and schist with small areas of Permian granite, general elevation 1050 to 1400m, local relief 100m. Substrate to the Tia Tops Landscape. Yellow and brown texture-contrast soils with deeper loam on alluvium. Woodland of snow gum (*Eucalyptus pauciflora*) and black sallee (*Eucalyptus stellulata*) on western ridges, with manna gum (*Eucalyptus viminalis*) and mountain gum (*Eucalyptus dalrympleana*) on mid-slopes and New England peppermint (*Eucalyptus cinerea*) in the valleys on cold sites. Open forest of; broad-leaved stringybark (*Eucalyptus caliginosa*), yellow box (*Eucalyptus melliodora*), narrow-leaved peppermint (*Eucalyptus radiata*), and narrow-leaved black peppermint (*Eucalyptus nicholii*) on better soils. Tall open forest of; New England blackbutt

(*Eucalyptus andrerwsii* ssp. *campanulata)*, silver-top stringybark (*Eucalyptus laevopinea*), diehard stringybark (*Eucalyptus cameronii*), narrow-leaved peppermint, on moist margins of the plateau and grey box (*Eucalyptus molucanna*), yellow box (*Eucalyptus melliodora*), Youman's stringybark (*Eucalyptus youmanii*) on dry margins. Silvertop stringybark and lightwood (*Acacia implexa*) with white box (*Eucalyptus albens*) on northern slopes.

Tia Tia Tops NET Walcha
Small plateau with conical peaks and stepped slopes on Tertiary basalt immediately above the Great Escarpment, general elevation 1100 to 1425m, local relief 200m. Red to brown structured loam and clay loam gradational profiles with high fertility. Open forest to tall open forest of; brown barrel (*Eucalyptus fastigata*), messmate (*Eucalyptus obliqua*), silvertop stringybark (*Eucalyptus laevopinea*), and manna gum (*Eucalyptus viminalis*) and as closed forests in protected valleys with cool temperate closed forest species in the understorey.

Urs Uralla Basalts and Sands NET Walcha
Undulating stepped high plateau on Tertiary basalt with underlying fluvial sand and gravel resting on an exhumed landscape of Permian granites. General elevation 950 to 1250m, local relief 150m. Red structured loams on ridges, brown structured gradational clay loams on slopes, dark self-mulching clays in valleys and red or yellow earth on sands and exposed granite. Open forest or woodland of manna gum (*Eucalyptus viminalis*) with some rough-barked apple (*Angophora floribunda*). Snow gum (*Eucalyptus pauciflora*) and black sallee (*Eucalyptus stellulata*) on cold valley floors and exposed peaks. Silvertop stringybark (*Eucalyptus laevopinea*), yellow box (*Eucalyptus melliodora*) and Blakely's red gum (*Eucalyptus blakelyii*) on lower elevations in the west.

Ybb Yarrowitch Basalt Plateau NET Walcha
Small plateau remnant on Tertiary basalt immediately above the Great Escarpment. An easterly extension of the Tia Tops Landscape at a lower elevation and higher rainfall, general elevation 950 to 1120m, local relief 100m. Red to brown structured loam and clay loam gradational profiles with high fertility. Open forest to tall open forest of; brown barrel (*Eucalyptus fastigata*), messmate (*Eucalyptus obliqua*), silvertop stringybark (*Eucalyptus laevopinea*), and manna gum (*Eucalyptus viminalis*) with cool temperate closed forest species in the understorey and as closed forest dominant communities, in protected valleys. Mostly cleared.

NNC - Descriptions for Landscapes in the NSW North Coast Bioregion

Meso: NNC Barrington - Gloucester

Btb Barrington Tops Basalt NNC Barrington - Gloucester
High plateau, peaks and ridges on Tertiary basalts, general elevation 1300 to 1600m, local relief 100m. Basalt extends radially from the plateau capping long ridges to lower elevations. Uniform profiles of alpine humus soils on the highest areas and deep red-brown to red structured loam gradational profiles with thinner stony profiles on steeper slopes. Subtropical closed forest on ridges and crests and in wider valleys of; sassafras (*Doryphora sassafras*), crabapple (*Schizomeria ovata*), soft corkwood (*Caldcluvia paniculosa*), scentless rosewood (*Synoum glandulosum*), churnwood (*Citronella moorei*), brown beech (*Pennantia cunninghamii*), and yellow carabeen (*Sloanea woollsii*). Temperate closed forest dominated by Antarctic beech (*Nothofagus moorei*) on basalt scree below cliffs.

Btg Barrington Tops Granite NNC Barrington - Gloucester

High plateau and rounded peaks on Permian granite and granodiorite stratigraphically beneath but sometimes physically above the Barrington Tops Basalt landscape. General elevation 1200 to 1600m, local relief 100m. Sandy alpine humus soils merging with red-brown gradational earths. Open sub-alpine grasslands with snow gum (*Eucalyptus pauciflora*) and black sallee (*Eucalyptus stellulata*) margins on highest parts and in frost hollows. Silvertop stringybark (*Eucalyptus laevopinea*), mountain gum (*Eucalyptus dalrympleana*), mountain mahogany (*Eucalyptus notabilis*), messmate (*Eucalyptus obliqua*), brown barrel (*Eucalyptus fastigata*), manna gum (*Eucalyptus viminalis*), with shrubby understorey, grasses and fern along stream lines at lower levels. Extensive sub-alpine valley floor sedge swamps and isolated stands of tall grass trees (*Xanthorrhoea* spp.).

Btm Barrington Tops Meta-sediments NNC Barrington - Gloucester

High plateau, peaks and ridges marginal to and lower than the Barrington Tops Granite landscape on weakly metamorphosed Devonian siltstone and sandstone, Carboniferous tuffaceous sandstone, mudstone, quartzose sandstone and conglomerate. Distinct radial drainage pattern from the Barrington complex, general elevation 500 to 1200m, local relief 500m. Higher slopes with gradational structured loams support subtropical closed forest, lower slopes and valleys with gradational and red-brown to yellow texture-contrast soils have tall forest of Sydney blue gum (*Eucalyptus saligna*), tallow wood (*Eucalyptus microcorys*), New England blackbutt (*Eucalyptus andrewsii* ssp. *campanulata)*, rough-barked apple (*Angophora floribunda*), forest oak (*Allocasuarina torulosa*), kangaroo grass (*Themeda triandra*), blady grass (*Imperata cylindrica*)and bracken (*Pteridium esculentum*).

Mgs Manning Great Escarpment Southern Aspects NNC Barrington - Gloucester

Ridges and hills on weakly metamorphosed Devonian siltstone and sandstone, Carboniferous tuffaceous sandstone, mudstone, quartzose sandstone and conglomerate. Overall southern and eastern aspects, general elevation 400 to 800m, local relief 250m. Shallow brown earths, grading to brown texture-contrast soils on lower slopes. Thin stony profiles on steep slopes, yellow texture-contrast soils on high river terraces. The valleys contain forest and open forest of spotted gum (*Corymbia maculata*), narrow-leaved ironbark (*Eucalyptus crebra*), white mahogany (*Eucalyptus acmenoides*), large-fruited grey gum (*Eucalyptus canaliculata*), cabbage gum (*Eucalyptus amplifolia*), grey box (*Eucalyptus moluccana*), rough-barked apple (*Angophora floribunda*) and forest oak (*Allocasuarina torulosa*) with river oak (*Casuarina cunninghamiana*) along the streams. In the east, lowland subtropical closed forest is found with; brush box (*Lophostemon confertus*), Sydney blue gum (*Eucalyptus saligna*), yellow carabeen (*Sloanea woollsii*), jackwood (*Cryptocarya glaucescens*), pigeonberry ash (*Cryptocarya erythroxylon*), pepperberry tree (*Cryptocarya obovata*), bolly gum (*Litsea reticulata*), sassafras (*Doryphora sassafras*), crabapple (*Schizomeria ovata*), white quandong (*Elaeocarpus kirtonii*), and churnwood (*Citronella moorei*) with cabbage-tree palm (*Livistona australis*) and bangalow palm (*Archontophoenix cunninghamiana*).

Mgw Manning Great Escarpment Western Aspects NNC Barrington - Gloucester

Folded and faulted weakly metamorphosed Devonian siltstone and sandstone, Carboniferous tuffaceous sandstone, mudstone, quartzose sandstone lithic sandstone, conglomerate and limited limestone. Overall western aspect, general elevation 400 to 800m, local relief 250m. Shallow brown earths, grading to brown texture-contrast soils on lower slopes with harsh subsoils. Thin stony profiles on steep slopes, yellow texture-contrast soils on high river terraces. Woodland of; white box (*Eucalyptus albens*), silvertop stringybark (*Eucalyptus laevopinea*), yellow box (*Eucalyptus melliodora*), forest red gum (*Eucalyptus tereticornis*) grading south and east to forest of; white mahogany (*Eucalyptus acmenoides*), large-fruited grey gum (*Eucalyptus canaliculata*), tallow wood (*Eucalyptus microcorys*), silvertop stringybark (*Eucalyptus laevopinea*) with grasses and ferns.

Mrr Mount Royal Ridges NNC Barrington - Gloucester

Steep ridges climbing to the Mount Royal Tops landscape on Devonian conglomerate, breccia, greywacke, cherty argillite and mudstone, with some Carboniferous mudstone and lithic sandstone. General elevation 400 to 700m, local relief 200m. Red-brown texture-contrast soils of variable depth related to slope angle. Subtropical closed forest similar to Barrington Tops Basalt Landscape under the escarpment and along upper parts of streams. River oak (*Casuarina cunninghamiana*) and sandpaper fig (*Ficus coronata*) as a gallery forest along lower parts of streams.

Mrt Mount Royal Tops NNC Barrington - Gloucester

High ridges on Tertiary basalts extending radially from a central high spine to lower elevations, general elevation 600 to 1100m, local relief 250m. Uniform profiles of deep red-brown to red structured loam and thinner stony gradational profiles on steeper slopes. Tall moist forest of New England blackbutt (*Eucalyptus campanulata)*, Sydney blue gum (*Eucalyptus saligna*), tallow wood (*Eucalyptus microcorys*), rough-barked apple (*Angophora floribunda*), forest oak (*Allocasuarina torulosa*), kangaroo grass (*Themeda triandra*), blady grass (*Imperata cylindrica*) and bracken (*Pteridium esculentum*).

Sgf Scone - Gloucester Foothills NNC Barrington - Gloucester

Foothills and ranges rising to the Manning Great Escarpment landscapes on extensively faulted Carboniferous tuffaceous sandstone and pyroclastics, conglomerate, mudstone, lithic sandstone, some limestone, and acid tuff. General elevation 200 to 600m, local relief 200m. Thin stony loams and red brown to yellow texture-contrast soils with harsh subsoils in valleys. Tall woodland and forest of; spotted gum (*Corymbia maculata*), large-fruited grey gum (*Eucalyptus canaliculata*), white stringybark (*Eucalyptus globoidea*), narrow-leaved ironbark (*Eucalyptus crebra*), rough-barked apple (*Angophora floribunda*), forest red gum (*Eucalyptus tereticornis*), yellow box (*Eucalyptus melliodora*), white box (*Eucalyptus albens*), with shrubs and grasses. Depauperate closed forest elements under cliff lines and in narrow protected valleys. Swamp oak (*Casuarina glauca*) along slightly brackish drainage lines otherwise river oak (*Casuarina cunninghamiana*) along most streams.

Meso: NNC Basalt Plateau

Com Comboyne Plateau NNC Basalt Plateau

Small plateau on Tertiary basalt and dolerite with several trachyte plugs forming conical peaks. General elevation 630 to 700m, peaks to 850m. Deep friable red loam. Mostly cleared originally covered by; yellow carabeen (*Sloanea woollsii*), scentless rosewood (*Synoum glandulosum*), black booyong (*Argyrondendron actinophyllum*) and soft corkwood (*Caldcluvia paniculosa*).

Dob Dorrigo Basalts NNC Basalt Plateau

Elongate ridge top plateau on Tertiary basalt flows, eastern extension of the Ebor Tops landscape at lower elevation. General elevation 800 to 900m, local relief 50m. Deep, red and red-brown well structured loams with high organic content in the topsoil and high fertility. Originally a major area of mixed warm temperate and cool temperate closed forest now mostly cleared. Subtropical closed forest of; red cedar (*Toona australis*), black booyong (*Argyrondendron actinophyllum*), and socketwood (*Daphnandra micrantha*). Areas of; shatterwood (*Backhousia sciadophora)*, giant stinging tree (*Dendrocnide excelsa*), shiny-leaved stinging tree (*Dendrocnide photinophylla*), and yellow tulip (*Drypetes australasica*). Warm temperate species include; coachwood (*Ceratopetalum apetalum*), native tamarind (*Diploglottis australis*), lilly pilly (*Acmena* spp.), pink cherry (*Austrobuxus swainii*), and honeysuckle bush (*Triunia youngiana*). Cool temperate and moist hardwood species include; Antarctic beech (*Nothofagus moorei*), blackwood (*Acacia melanoxylon*), forest oak (*Allocasuarina torulosa*), coast banksia (*Banksia integrifolia*). The area contains a number of

endemics including; Dorrigo waratah (*Oreocallis pinnata*), Dorrigo laurel (*Cryptocarya* spp.) and Dorrigo plum (*Endiandra introrsa*).

Meso: NNC Coastal Barriers

Mmb Manning - Macleay Barriers and Beaches NNC Coastal Barriers
Beaches, dunes, swamps and lagoons on Quaternary coastal sands, with inner and outer barrier dune sequences, general elevation 0 to 25m, local relief 10 to 20m. Yellow or white single grain quartz sand on destabilised dunes, well developed iron and humic podsols with depth to pan varying with position in the dune sequence, topography and depth to groundwater. Outer barrier; foredune with coast Spinifex coast wattle (*Acacia sophorae*), and coast tea tree (*Leptospermum laevigatum*). Hind dunes with blackbutt (*Eucalyptus pilularis*), pink bloodwood (*Corymbia. intermedia*), old man banksia (*Banksia serrata*) and rainforest elements including blue lilly pilly (*Syzygium oleosum*), green tamarind (*Elattostachys nervosa*), native guava (*Rhodomyrtus psidioides*), plum pine (*Podocarpus elatus*), tuckeroo (*Cupaniopsis anacardioides*), bauerella (*Sarcomelicope simplicifolia*) and vines. Swampy lagoon zone of wet heath and swamp forest between the barriers with; dense tea tree (*Leptospermum* spp.), paperbark (*Melaleuca quinquenervia*), swamp oak (*Casuarina glauca*), and swamp mahogany (*Eucalyptus robusta*). Inner barrier dunes tall forest of; blackbutt, northern scribbly gum (*Eucalyptus signata*), needlebark stringybark (*Eucalyptus planchoniana*) and red bloodwood (*Corymbia gummifera*). Wet heath with lemon scented tea tree (*Leptospermum petersonii*), prickly tea tree (*Leptospermum. continentale*), swamp banksia (*Banksia robur*) rushes and sedges.

Mfb Myall - Forster Barrier NNC Coastal Barriers
Beaches, dunes, swamps and lagoons on Quaternary coastal sands, with inner and outer barrier dune and swamp sequences. Active dunes where destabilised. General elevation 0 to 50m, local relief 10 to 20m. Yellow or white single grain quartz sand on destabilised dunes, well developed iron and humic podsols with depth to pan varying with position in the dune sequence, topography and depth to groundwater. Outer barrier; foredune with coast spinifex (*Spinifex hirsutus*), hind dunes with smooth-barked apple (*Angophora costata*), blackbutt (*Eucalyptus pilularis*), red bloodwood (*Corymbia gummifera*) and old man banksia (*Banksia serrata*). Grasslands of kangaroo grass (*Themeda triandra*), blady grass (*Imperata cylindrica*) and *Lomandra longifolia* at the inner edges of high dunes. Swampy lagoon zone of wet heath and swamp forest between the barriers with; dense tea tree (*Leptospermum* spp.), paperbark (*Melaleuca quinquenervia*), swamp oak (*Casuarina glauca*), and swamp mahogany (*Eucalyptus robusta*) Inner barrier dunes; tall forest of smooth-barked apple, red bloodwood, old man banksia and blackbutt. Small patches of closed forest of; yellow tulip (*Drypetes australasica*), bauerella (*Sarcomelicope simplicifolia*), red olive plum (*Cassine australis*), plum pine (*Podocarpus elatus*) and numerous vines.

Myh Myall River Channel and Floodplains NNC Coastal Barriers
Channels, floodplain, terraces and estuary of the Myall River on Quaternary alluvium, general elevation 0 to 25m, local relief 10m. Dark organic loams and silty clay on the floodplain, gradational brown loams on terraces and organic sand in the estuary. Fringe forest in fresh water of swamp oak (*Casuarina glauca*), swamp mahogany (*Eucalyptus robusta*) and paperbark (*Melaleuca quinquenervia*). Wet forest of; rough-barked apple (*Angophora floribunda*), spotted gum (*Corymbia maculata*), tallow wood (*Eucalyptus microcorys*) and grey gum (*Eucalyptus punctata*) on low bedrock rises. Mangroves (*Avicennia marina* and *Aegiceras corniculatum*) only occur where lagoons are frequently open.

Meso: NNC Manning - Macleay

Bec Bellinger Channels and Floodplains NNC Manning - Macleay

Channels, narrow floodplain, terraces and estuary of the Bellinger River and tributaries on Quaternary alluvium, general elevation 0 to 50m, local relief 15m. Dark organic loams and silty clay on the floodplain, gradational brown loams on terraces and organic sand and silty mud in the estuary. Flooded gum (*Eucalyptus grandis*) on alluvial river flats, river oak (*Casuarina cunninghamiana*) along the banks. The estuary includes; grey mangrove (*Avicennia marina*), river mangrove (*Aegiceras corniculatum*), milky mangrove (*Excoecaria agallocha*), saltmarsh species and fresh water margins of swamp oak (*Casuarina glauca*) and paperbark (*Melaleuca quinquenervia*).

Bcr Brooms Head - Kempsey Coastal Ramp NNC Manning - Macleay
Hills and low ranges of the coastal fall on lower Devonian greywacke, slate phyllite and quartzite and Permian Phyllite and schistose sandstone. General elevation 50 to 450m, local relief 300m. Thin, stony gradational loam and sandy loam on the slopes grading to yellow-brown texture-contrast soils on lower slopes and in valleys. Dry hardwood forest of; blackbutt (*Eucalyptus pilularis*), Sydney blue gum (*Eucalyptus saligna*), and large-fruited blackbutt (*Eucalyptus pyrocarpa*).

Brp Brothers Peaks NNC Manning - Macleay
Circular hills and sub-rounded peaks with radial drainage formed on Triassic stocks of diorite and microgranite intruding early Triassic mudstone, lithic sandstone and coal measures of the Lorne Basin. General elevation 50 to 560m, local relief 400m.Gritty uniform and gradational sandy loam profiles grading to red-yellow texture-contrast profiles on lower slopes. South east flanks carry subtropical closed forest with; yellow carabeen (*Sloanea woollsii*), sassafras (*Doryphora sassafras*), myrtle ebony (*Diospyros pentamera*), soft corkwood (*Caldcluvia paniculosa*), bangalow palm (*Archontophoenix cunninghamiana*) and epiphytes. On other aspects brush box (*Lophostemon confertus*) is common.

Blg Bulga Plateau NNC Manning - Macleay
Isolated plateau remnant on lower Devonian schist, phyllite, slate chert, jasper, tuff, and less metamorphosed sediments, general elevation 600 to 700m, local relief 50m. Thin stony loams with moderate organic content on slopes with deeper gradational profiles on the plateau. Moist hardwood forest with closed forest understorey; Sydney blue gum (*Eucalyptus saligna*), tallow wood (*Eucalyptus microcorys*), turpentine (*Syncarpia glomulifera*), brush box (*Lophostemon confertus*), red bloodwood (*Corymbia. gummifera*), forest red gum (*Eucalyptus tereticornis*) and broad-leaved apple (*Angophora subvelutina*).

Has Hastings Channels and Floodplains NNC Manning - Macleay
Channels, floodplain, terraces and estuary of the Hastings River and tributaries on Quaternary alluvium, general elevation 0 to 50m, local relief 15m. Dark organic loams and silty clay on the floodplain, gradational brown loams on terraces and organic sand and silty mud in the estuary. Flooded gum (*Eucalyptus grandis*) on alluvial river flats and river oak (*Casuarina cunninghamiana*) along the banks. The estuary includes; grey mangrove (*Avicennia marina*), river mangrove (*Aegiceras corniculatum*), milky mangrove (*Excoecaria agallocha*), saltmarsh species and fresh water margins of swamp oak (*Casuarina glauca*) and paperbark (*Melaleuca quinquenervia*).

Ina Ingalba Coastal Hills NNC Manning - Macleay
Coastal hills and slopes on lower Permian slate, phyllite, schistose sandstone and schistose conglomerate. General elevation 0 to 830m, local relief 350m. Thin, stony gradational loam and sandy loam on the slopes grading to yellow-brown texture-contrast soils on lower slopes and in valleys. Dry coastal hardwood forest of; blackbutt (*Eucalyptus pilularis*), spotted gum (*Corymbia maculata*), large-fruited blackbutt (*Eucalyptus pyrocarpa*), tallow wood (*Eucalyptus microcorys*), Sydney blue gum (*Eucalyptus saligna*), northern grey gum (*Eucalyptus propinqua*), white mahogany (*Eucalyptus acmenoides*) and grey ironbark (*Eucalyptus paniculata*).

Mef Macleay Escarpment Foothills NNC Manning - Macleay

Ridges, hills and drainage basins leading up to the Great Escarpment on complex and poorly known geology of Silurian-Devonian, Permian and Carboniferous schist, phyllite, slate, quartzite, schistose sandstone, conglomerate, sandstone, mudstone, limited limestone and interbedded volcanics. General elevation 200 to 500m, local relief 250m. Shallow brown earths, grading to brown texture-contrast soils on lower slopes. Thin stony profiles on steep slopes, yellow texture-contrast soils on high river terraces in wider valleys. The valleys and near coastal sectors contain forest and open forest of spotted gum (*Corymbia maculata*), narrow-leaved ironbark (*Eucalyptus crebra*), white mahogany (*Eucalyptus acmenoides*), large-fruited grey gum (*Eucalyptus canaliculata*), cabbage gum (*Eucalyptus amplifolia*), grey box (*Eucalyptus moluccana*), rough-barked apple (*Angophora floribunda*) and forest oak (*Allocasuarina torulosa*) with river oak (*Casuarina cunninghamiana*) along the streams. In the west and extending into the gorges lowland subtropical closed forest is found with; brush box (*Lophostemon confertus*), Sydney blue gum (*Eucalyptus saligna*), yellow carabeen (*Sloanea woollsii*), jackwood (*Cryptocarya glaucescens*), pigeonberry ash (*Cryptocarya erythroxylon*), pepperberry tree (*Cryptocarya obovata*), bolly gum (*Litsea reticulata*), sassafras (*Doryphora sassafras*), crabapple (*Schizomeria ovata*), white quandong (*Elaeocarpus kirtonii*), and churnwood (*Citronella moorei*) with cabbage-tree palm (*Livistona australis*) and bangalow palm (*Archontophoenix cunninghamiana*). Dry closed forest on steep sites protected from fire, small areas with cool temperate closed forest components on southern aspects at higher altitudes. Limestone areas have not been mapped but include both the Kunderang Brook and Willi Willi karst.

Maf Manning - Macleay Channels and Floodplains NNC Manning - Macleay

Channels, floodplain, terraces, swamps and estuary of the Manning and Macleay Rivers and other coastal streams on Quaternary alluvium. Extensive floodplain swamps at tributary junctions. General elevation 0 to 50m, local relief 15m. Dark organic loams and silty clay, organic mud in the estuary. Flooded gum (*Eucalyptus grandis*) on alluvial river flats and river oak (*Casuarina cunninghamiana*) along the banks. Large freshwater wetlands with common reed (*Phragmmites australis*), spike rush (*Eleocharis* spp.), water couch (*Paspalum paspaloides*), broad-leaved paperbark (*Melaleuca quinquenervia*) and swamp oak (*Casuarina glauca*). The estuary includes; grey mangrove (*Avicennia marina*), river mangrove (*Aegiceras corniculatum*), milky mangrove (*Excoecaria agallocha*) and saltmarsh communities.

Mml Manning - Macleay Coastal Alluvial Plains NNC Manning - Macleay

Wide valleys, channels, floodplains, swamps, and terraces of the Manning and Macleay rivers and other coastal streams on Quaternary alluvium, general elevation 0 to 50m, local relief 15m. Dark organic loams and silty clay on the floodplain, gradational brown loams and yellow-brown texture-contrast soil on terraces, organic silty mud in swamps.

Pmr Port Macquarie Coastal Ramp NNC Manning - Macleay

Ranges and steep hills on the coastal fall on upper Permian pebbly mudstone, siltstone, conglomerate and sandstone, Carboniferous lithic sandstone, greywacke, tuff, mudstone and some limestone. General elevation 50 to 640m, local relief 350m. Higher slopes with gradational structured loams merging to red-brown to yellow texture-contrast soils on lower slopes and in valleys. Blackbutt (*Eucalyptus pilularis*), grey gum (*Eucalyptus punctata*), white mahogany (*Eucalyptus acmenoides*), and brush cypress pine (*Callitris macleayana*) on ridges. Tallow wood (*Eucalyptus microcorys*), Sydney blue gum (*Eucalyptus saligna*), brush box (*Lophostemon confertus*), in valleys. Flooded gum (*Eucalyptus grandis*), turpentine (*Syncarpia glomulifera*), with closed forest elements such as; crabapple (*Schizomeria ovata*), sassafras (*Doryphora sassafras*), hard corkwood (*Endiandra sieberi*) and silver sycamore (*Cryptocarya* spp.) on the flats.

Sms Stroud Mountains NNC Manning - Macleay
Northwest oriented ranges with high peaks and parallel valleys on extensively faulted and folded middle Devonian lithic sandstones, mudstone, chert and minor volcanics, Carboniferous conglomerate, lithic sandstone, mudstone, interbedded dacite and ignimbrite, Permian pebbly lithic sandstone, with interbedded rhyolite, dacite and basalt. Strong structural control, general elevation 50 to 680m, local relief 400m. Higher slopes with gradational structured loams merging to red-brown to yellow texture-contrast soils on lower slopes and in valleys. Mixtures of moist and dry forests and rainforest understorey with; brush box (*Lophostemon confertus*), flooded gum (*Eucalyptus grandis*), turpentine (*Syncarpia glomulifera*), scentless rosewood (*Synoum glandulosum*), lilly pilly (*Acmena* spp.), rose maple (*Cryptocarya erythroxylon*), narrow-leaved palm lily (*Cordyline stricta*), southern mahogany (*Eucalyptus botryoides*), spotted gum (*Corymbia maculata*) and grey ironbark (*Eucalyptus paniculata*). River oak (*Casuarina cunninghamiana*) along all major streams.

Tin Tinebank Granites NNC Manning - Macleay
Isolated conical peaks with abundant rock outcrop and radial drainage on Permian granite and granodiorite General elevation 100 to 970m, local relief 600m. Gritty uniform red-brown loamy sand near rock outcrop merging to deeper gradational yellow-brown profiles on lower slopes. Subtropical to warm temperate closed forest of coachwood (*Ceratopetalum apetalum*), sassafras (*Doryphora sassafras*) and crabapple (*Schizomeria ovata*) on southern aspects, moist hardwood forest with grey gum (*Eucalyptus punctata*), white mahogany (*Eucalyptus acmenoides*), merging to spotted gum (*Corymbia maculata*) and blackbutt (*Eucalyptus pilularis*) elsewhere.

Vag Valla Granite NNC Manning - Macleay
Rounded isolated steep hills with radial drainage on small stocks of upper Permian granite General elevation 50 to 450m, local relief 300m. Gritty uniform red-brown loamy sand near rock outcrop merging to deeper gradational yellow-brown profiles on lower slopes. No details known of the vegetation but expected to be dry coastal hardwood forest.

Wcf Wauchope Coastal Foothills NNC Manning - Macleay
Hills and ranges of the coastal fall with dendritic drainage on faulted Carboniferous lithic sandstone, siltstone, tuff and some limestone. General elevation 50 to 460m, local relief 200m. Red and yellow texture-contrast soils throughout. Dry hardwood forests of; blackbutt (*Eucalyptus pilularis*), white mahogany (*Eucalyptus acmenoides*), spotted gum (*Corymbia maculata*), forest red gum (*Eucalyptus tereticornis*), grey gum (*Eucalyptus punctata*) and red bloodwood (*Corymbia gummifera*).

Meso: NNC Manning - Macleay Karst

Yek Yessabah Karst NNC Manning - Macleay Karst
Gentle hills and flats on lower Permian limestone with well developed karst features, general elevation 200 to 250m, local relief 50m. Brown to red-brown structured clay and clay loam with some deep pockets. Lowland subtropical closed forest of; *Actephila lindleyi*, yellow tulip (*Drypetes australasica*), giant stinging tree (*Dendrocnide excelsa*), scentless rosewood (*Synoum glandulosum*), Port Jackson fig (*Ficus rubiginosa*), shatterwood (*Backhousia sciadophora)*, white cedar (*Melia azedarach*), and small-leaved laurel (*Cryptocarya* spp.). Hardwood forest on drier sites with; white mahogany (*Eucalyptus acmenoides*), small-fruited grey gum (*Eucalyptus propinqua*), tallow wood (*Eucalyptus microcorys*), grey ironbark (*Eucalyptus paniculata*), and pink bloodwood (*Corymbia intermedia*).

Meso: NNC Nymboida

Nge Nymboida Great Escarpment NNC Nymboida

Ranges, peaks and steep escarpment with high waterfalls and deep gorges on main streams on Permian/Carboniferous granite, granodiorite and small intrusions dolerite and amphibolite within extensive area of moderately deformed Silurian-Devonian sandstone, greywacke, tuff, phyllite and slate. Northern sector is on slightly deformed Permian dacite and pyroclastics interbedded with conglomerate, sandstone and mudstone. General elevation 400 to 1400m, local relief 500m. Soils vary from shallow gritty sandy loam through red and yellow earthy gradational profiles to deep siliceous sands and loams on valley floors. Vegetation also varies with elevation, aspect and soil quality. In the west closed cool temperate forest of coachwood (*Ceratopetalum apetalum*), crabapple (*Schizomeria ovata*), soft corkwood (*Caldcluvia paniculosa*) and yellow carabeen (*Sloanea woollsii*). At mid-altitude New England blackbutt (*Eucalyptus andrewsii* ssp. *campanulata)* occurs with rainforest species in the understorey. Toward the coast on drier sites tall forests of spotted gum (*Corymbia maculata*), red bloodwood (*Corymbia gummifera*), mountain gum (*Eucalyptus dalrympleana*), blackbutt (*Eucalyptus pilularis*), narrow-leaved peppermint (*Eucalyptus radiata*) and forest oak (*Allocasuarina torulosa*). At low altitude on high quality sites subtropical closed forest with; yellow carabeen, pigeonberry ash (*Cryptocarya erythroxylon*) and sour cherry (*Syzgium coryanthum*). River oak (*Casuarina cunninghamiana*) occurs along all streams.

Nms Nymboida Meta-sediments NNC Nymboida

Ranges, peaks and steep escarpment with high waterfalls and deep gorges on main streams on deformed steep dipping Carboniferous siliceous indurated mudstone, slate, chert and jasper, general elevation 300 to 1300m, local relief 700m, slopes to 300. Strong structural control on stream patterns and major topographic features, especially gorges and waterfalls. Soils are generally thin, stony and of low fertility and subtropical closed forests only occur where plant nutrients are available because of unusual rock types or through accumulation in the litter cycle. On the margin of the Great Escarpment snow gum (*Eucayptus pauciflora*) woodland and wet heath is found. Within the gorges scree slopes with dry closed forest and stands of New England blackbutt (*Eucalyptus andrewsii* ssp. *campanulata)* merge down valley and down slope into mixed warm temperate and subtropical closed forest groups with; coachwood (*Ceratopetalum apetalum*), crabapple (*Schizomeria ovata*), yellow carabeen (*Sloanea woollsii*), soft corkwood (*Caldcluvia paniculosa*), silvertop stringybark (*Eucalyptus laevopinea*) and messmate (*Eucalyptus obliqua*). At lower elevations forests of; tallow wood (*Eucalyptus microcorys*), silver-leaved stringybark (*Eucalyptus cephalocarpa*) spotted gum (*Corymbia maculata*), cabbage gum (*Eucalyptus amplifolia*), yellow box (*Eucalyptus melliodora*), broad-leaved stringybark (*Eucalyptus caliginosa*) and forest oak (*Allocasuarina torulosa*) are mingled with stands of subtropical closed forest with; yellow carabeen, pigeonberry ash (*Cryptocarya erythroxylon*), sour cherry (*Syzgium corynanthum*), brush box (*Lophostemon confertus*), murrogun (*Cryptocarya microneura*), bolwarra (*Eupomatia laurina*), scentless rosewood (*Synoum glandulosum*) and orange thorn (*Citriobatus lancifolius*). River oak (*Casuarina cunninghamiana*) occurs along all streams.

Meso: NNC Ultramafics

Nys Nowendoc - Yarras Serpentinite NNC Ultramafics

Isolated linear areas of lower Permian serpentinite and ultrabasic intrusives on low angle slopes, general elevation 400m at Yarras, Mooral Creek, and Mount George, 900m at Nowendoc, local relief 20 to 100m. Thin stony loam with high metal content, few details of soil or vegetation are known but the area is expected to contain unusual species.

NSS - Descriptions for Landscapes in the NSW South West Slopes Bioregion

Meso: NSS Karst

Wkk Wellington - Molong Karst NSS Karst
Discrete areas of strike ridges, and large outcrops with karst features on massive Ordovician limestone, general elevation 600 to 350m, local relief 60m. Red-brown to red well structured gradational loam and clay loam. Soil depth varies from a few centimetres up to 5m in deep pockets. Grey box (*Eucalyptus microcarpa*) woodland with apple box (*Eucalyptus bridgesiana*), red stringybark (*Eucalyptus macrorhyncha*), Blakely's red gum (*Eucalyptus blakelyii*), and kurrajong (*Brachychiton populneus*) on the limestone, yellow box (*Eucalyptus melliodora*) and rough barked apple (*Angophora floribunda*) on adjacent slopes and river flats, river oak (*Casuarina cunninghamiana*) along running streams.

Meso: NSS Lachlan

Cap Calarie Plains NSS Lachlan
Undulating low hills and rises on folded steep dipping Ordovician quartz sandstone, slate and chert, Silurian and Devonian quartzite, sandstone, conglomerate and small areas of limestone. General elevation 250 to 300m, local relief 15m. Open woodlands of red ironbark (*Eucalyptus sideroxylon*) and grey box (*Eucalyptus microcarpa*) with a grassy understorey.

Meso: NSS Lower Slopes

Aoh Albury - Oaklands Hills and Footslopes NSS Lower Slopes
Isolated hills and rises on folded lower Ordovician greywacke, phyllite, chert, schist and small areas of Silurian-Devonian granite, general elevation 150 to 480m, local relief 20 to 150m. Shallow gritty loam amongst rock outcrop on hills, red-brown texture-contrast soil on slopes with bleached A_2 horizons and strongly structured subsoil. Low open woodland of; Dwyer's mallee gum (*Eucalyptus dwyeri*), grey box (*Eucalyptus microcarpa*), white box (*Eucalyptus albens*), currawang (*Acacia doratoxylon*), drooping she-oak *Allocasuarina verticillata,* with understorey of; *Gonocarpus elatus, Erodium botrys,* and nodding blue-lily (*Stypandra glauca*). Yellow box (*Eucalyptus melliodora*) and grey box grassy woodlands on foot slopes.

Adh Ardlethan Hills NSS Lower Slopes
Ardlethan Hills Landscape includes the *Ardlethan* land system.

Rolling hills and rises on Ordovician quartzose sandstone, greywacke, chert, and phyllite, general elevation 200 to 412m, local relief 50 to 60m. Stony red and brown texture-contrast soils merging to calcareous red earth on valley floors. Woodlands of; bimble box (*Eucalyptus populnea*), currawang (*Acacia doratoxylon*), white cypress pine (*Callitris glaucophylla*) and red ironbark (*Eucalyptus sideroxylon*). Shrubs common including; western golden wattle (*Acacia decora*), yarran (*Acacia homalophylla*), wilga (*Geijera parviflora*) and needle wattle (*Acacia rigens*). Dense bimble box (*Eucalyptus populnea*) and black box (*Eucalyptus largiflorens*) in the valleys. Large areas white (*Eucalyptus dumosa*), green (*Eucalyptus viridis*) and red mallee (*Eucalyptus socialis*) with dwarf red ironbark, black cypress pine (*Callitris endlicheri*) and mallee broombush (*Melaleuca uncinata*).

Bim Bimbi Plains NSS Lower Slopes
Bimbi Plains landscape includes the *Bimbi* land system.

Quaternary alluvial plains from bedrock hills and ridges of the *Gobondery/Gillenbine* and the *Belmont/Brooklyn* land systems. General elevation 200 to 250m, local relief 30m. Gravelly clay loams and red brown clays, red-brown texture-contrast soils on higher slopes grading to red-brown gradational and uniform profiles of clay loams and clays along creeks. Grey box (*Eucalyptus microcarpa*) and white cypress pine (*Callitris glaucophylla*) originally dominant, sparse bimble box (*Eucalyptus populnea*) along creek lines. Mostly cleared and cultivated.

Bro Brokong Plains NSS Lower Slopes

Quaternary alluvial plains, general elevation 170m, local relief <10m. Red-brown texture-contrast soils, extensively cleared and cropped, formerly grey box (*Eucalyptus microcarpa*), yellow box (*Eucalyptus melliodora*), Blakely's red gum (*Eucalyptus blakelyii*) and white cypress pine (*Callitris glaucophylla*) woodland to open forest.

Bug Buckingbong Gravels NSS Lower Slopes

Slightly elevated relic plain on poorly consolidated Tertiary quartz gravel, sand and clay, general elevation 130 to 170m, local relief <15m. Gravelly yellow earth, siliceous sands in streambeds and occasional red-yellow texture-contrast soil on clays. White cypress pine (*Callitris glaucophylla*) forest with grey box (*Eucalyptus microcarpa*), yellow box (*Eucalyptus melliodora*) and grasses including, spear grass (*Stipa* spp.), windmill grass (*Chloris* spp.), wallaby grass (*Danthonia* spp.), wire grasses (*Aristida* spp.) and red-leg grass (*Bothriochloa macra*).

Cls Cowal Lakes, Swamps and Lunettes NSS Lower Slopes

Ephemeral lakes, swamps and associated channels and lunettes on Quaternary alluvial clay, sandy clay and sand, general elevation 200m, local relief 10 to 15m. Grey and brown cracking clays with some Gilgai in channels and the lakebed, deep red-yellow siliceous sand on the lunette. Lignum (*Muehlenbeckia cunninghamii*) on the lakebed. Black box (*Eucalyptus largiflorens*), river cooba (*Acacia stenophylla*) and river red gum (*Eucalyptus camaldulensis*) around the shore and on the lunette, and bimble box (*Eucalyptus populnea*) and myall (*Acacia pendula*) on adjacent plains.

Gnm Ganantagi Mountain and Footslopes NSS Lower Slopes

Ganantagi Mountain and Footslopes Landscape includes the Derriwong *Mountain* land system.

Isolated rounded, rocky mountain peaks on Devonian granite and sandstone and conglomerate with colluvial aprons of coarse debris. General elevation 250 to 450m, local relief 150m. Thin stony sandy loam between rock outcrops grading to thick gravelly red-brown texture-contrast soil on the aprons. Stunted white cypress pine (*Callitris glaucophylla*) and Dwyer's mallee gum (*Eucalyptus dwyeri*) on the peaks. Bimble box (*Eucalyptus populnea*), currawang (*Acacia doratoxylon*), green mallee (*Eucalyptus viridis*), other acacia and shrubs on colluvial slopes merge down slope to grey box (*Eucalyptus microcarpa*), myall (*Acacia pendula*) and spiny saltbush (*Rhagodia spinescens*) sometimes on heavy grey clay with deep gilgai.

Goh Goonumbla Hills NSS Lower Slopes

Rounded low hills on Ordovician and Silurian sandstone, andesite, siltstone and phyllite with a partial blanket of Tertiary(?) quartz gravels and sands. General elevation 290 to 390m, local relief 70m. Stony yellow earths on the sands, thin brown structured loams on the hills merging with red-brown and red texture-contrast soils on the flats. Open forest of grey box (*Eucalyptus microcarpa*), white cypress pine (*Callitris glaucophylla*), with bimble box (*Eucalyptus populnea*) in the creeks and red ironbark (*Eucalyptus sideroxylon*) with shrubs on the gravels. Extensively cleared, grazed and cultivated

Gnr Gunningbland Range and Slopes NSS Lower Slopes

Low ranges, strike ridges and isolated hills on lower Devonian dacite, rhyolite, quartz sandstone, siltstone and minor conglomerate, general elevation 290 to 340m, local relief 30m. Shallow red-brown texture-contrast soils with woodlands of; Dwyer's mallee gum (*Eucalyptus dwyeri*), red ironbark (*Eucalyptus sideroxylon*), white cypress pine (*Callitris glaucophylla*), currawang (*Acacia doratoxylon*), grey box (*Eucalyptus microcarpa*), scattered kurrajong (*Brachychiton populneus*), wilga (*Geijera parviflora*), budda (*Eremophila mitchellii*) and occasional rosewood (*Heterodendrum oleifolium*) on slopes. Bull oak (*Allocasuarina luehmannii*) and bimble box (*Eucalyptus populnea*) along creek lines.

Jms Jemalong Range and Slopes NSS Lower Slopes

Prominent strike ridges of upper Devonian quartz sandstone. Oriented north south with well-defined water gaps. General elevation 250 to 400m, local relief 120 to 150m, and prominent asymmetry with steeper eastern faces of stepped cliffs and narrow benches. Lower colluvial slopes of coalescing alluvial fans on small streams. Thin very stony soils on ridges with abundant currawang (*Acacia doratoxylon*), red stringybark (*Eucalyptus macrorhyncha*), red ironbark (*Eucalyptus sideroxylon*), Dwyer's red gum (*Eucalyptus dwyeri*) and black cypress pine (*Callitris endlicheri*). Deeper stony soils on lower slopes with grey box (*Eucalyptus microcarpa*), red ironbark, bimble box (*Eucalyptus populnea*) and some white box (*Eucalyptus albens*).

Lbc Lachlan - Bland Channels and Floodplains NSS Lower Slopes

Extensive Quaternary alluvial plains at the break in slope between the western slopes and western plains. Numerous tributary streams with levees and backplain swamps, occasional lakebed. General elevation 200 to 280m, local relief <10m. Grey cracking clays with gilgai along channels and in swamps. Low levees of red-brown sand or loamy sand on stream banks, extensive red-brown structured texture-contrast soils on the plain. Extensively cleared and cropped. Woodlands of bimble box (*Eucalyptus populnea*), grey box (*Eucalyptus microcarpa*), yellow box (*Eucalyptus melliodora*) and white cypress pine (*Callitris glaucophylla*) with grasses. River red gum (*Eucalyptus camaldulensis*) and river cooba (*Acacia stenophylla*) along creeks, black box (*Eucalyptus largiflorens*) lining back-plain swamp margins. Lignum (*Muehlenbeckia cunninghamii*), common reed (*Phragmites australis*) and cane grass (*Eragrostis australasica*) on lake floors and larger swamps. Bull oak (*Allocasuarina luehmannii*) and belah (*Casuarina cristata*) on extensive gilgai.

Lea Leadley Hills NSS Lower Slopes

Leadley Hills landscape includes the *Leadley* land system.

Rocky strike ridges and rounded peaks of Devonian siliceous lava, breccia and ignimbrite, joint controlled drainage patterns, general elevation 250 to 370m, local relief 80m. Thin gritty grey loams supporting stunted white cypress pine (*Callitris glaucophylla*), currawang (*Acacia doratoxylon*) and Dwyer's mallee gum (*Eucalyptus dwyeri*) with diverse understorey of acacia and other shrubs. Red ironbark (*Eucalyptus sideroxylon*), grey box (*Eucalyptus microcarpa*) and patches of green mallee (*Eucalyptus viridis*) in deeper sandy loam soils. Dense patches of spur-wing wattle (*Acacia triptera*), possibly related to past fires.

Lkh Lockhart Hills and Footslopes NSS Lower Slopes

Isolated steep rocky ridges on Devonian conglomerate, quartz sandstone and limited siltstone standing as prominent peaks and ridges above the plain. General elevation 250 to 550m, local relief 80 to 200m. Crests with thin stony sands and rock outcrop, benched slopes with alternating rock outcrop and low cliffs and benches with gradational or occasional red-brown texture-contrast soils. Wide foot slopes with layered colluvium, sandstone boulders and stony brown harsh texture-contrast soils. Tumbledown red gum (*Eucalyptus dealbata*), red ironbark (*Eucalyptus sideroxylon*), red stringybark (*Eucalyptus macrorhyncha*), hill oak (*Allocasuarina verticallata*), daphne heath (*Brachyloma daphnoides*), golden wattle (*Acacia pycnantha*), and grasses. White cypress pine (*Callitris glaucophylla*) around the base of the hill and black cypress (*Callitris endlicheri*) on the crests.

Mtl Murrumbidgee - Tarcutta Lakes, Swamps and Lunettes NSS Lower Slopes

Back plain swamps with Quaternary fluvial and lacustrine sediments filled by high river flows. General elevation 150m, local relief <5m. Heavy self-mulching and cracking grey or brown clay, loamy sand lunette with red-brown gradational profile. Swamp floor with lignum (*Muehlenbeckia cunninghamii*) and cane grass (*Eragrostis australasica*), margins with black box (*Eucalyptus largiflorens*) and river cooba (*Acacia stenophylla*), inlet/outlet channels lined

with river red gum (*Eucalyptus camaldulensis*). Lunettes with black box and white cypress pine (*Callitris glaucophylla*).

Mtd Murrumbidgee - Tarcutta Source-bordering Dunes NSS Lower Slopes
Low sandy rises on Quaternary sand blow from adjacent river channels, general elevation 150m, local relief <5m. Red-brown gradational profile of loamy sand, white cypress pine (*Callitris glaucophylla*) and grasses.

Nah Narromine Hills NSS Lower Slopes
Low rounded hills standing above the alluvial plain on Ordovician and Devonian quartz sandstone, siltstone, chert and phyllite, general elevation 240 to 290m, local relief 40m. Red-brown texture-contrast soils thicker on the western aspects. Woodlands of grey box (*Eucalyptus microcarpa*), yellow box (*Eucalyptus melliodora*), Dwyer's mallee gum (*Eucalyptus dwyeri*), and white cypress pine (*Callitris glaucophylla*) with wilga (*Geijera parviflora*), yarran (*Acacia homalophylla*) and other shrubs.

Quh Quandong Hills NSS Lower Slopes
Low hills on Ordovician sandstone, slate and phyllite, general elevation 350 to 510m, local relief 30 to 100m. Gravelly clay loams and red brown clays, red-brown texture-contrast soils on higher slopes grading to red-brown gradational and uniform profiles of clay loams and clays along creeks. Grey box (*Eucalyptus microcarpa*), white cypress pine (*Callitris glaucophylla*), sparse bimble box (*Eucalyptus populnea*) along creek lines. Mostly cleared and cultivated.

Sph Springdale Hills NSS Lower Slopes
Rounded ridges and a few peaks on Silurian sandstone, shale and acid volcanics, general elevation 300 to 530m, local relief 150m. Gravelly uniform clay loams and red-brown texture-contrast soils. Grey box (*Eucalyptus microcarpa*), red ironbark (*Eucalyptus sideroxylon*), white cypress pine (*Callitris glaucophylla*) and patches of mallee. Bimble box (*Eucalyptus populnea*) along creek lines.

Tbm Talabung Mountain NSS Lower Slopes
Isolated moderately steep peaks and hills on Devonian dacite, rhyolite, andesite and tuffs, general elevation 300 to 550m, local relief 180m. Rocky peak with rubbly red-brown loamy sand uniform and gradational profiles. White cypress pine (*Callitris glaucophylla*), Dwyer's red gum (*Eucalyptus dwyeri*) with spear grasses (*Stipa* spp.) and wallaby grass (*Danthonia* spp.).

Tuh Tullamore Hills NSS Lower Slopes
Strike ridges on either side of a broad synclinal fold on Devonian quartz sandstone, siltstone, conglomerate, rhyolite, dacite, tuff and calcareous sandstone, general elevation 250 to 300m, local relief 30m. Thin yellow and grey loams supporting stunted white cypress pine (*Callitris glaucophylla*), currawang (*Acacia doratoxylon*) and Dwyer's mallee gum (*Eucalyptus dwyeri*) with diverse understorey of acacia and other shrubs on ridges. Red ironbark (*Eucalyptus sideroxylon*), grey box (*Eucalyptus microcarpa*) and patches of green mallee (*Eucalyptus viridis*) with spur-wing wattle (*Acacia triptera*) in deeper sandy loam soils.

Wrs Warrumba Range and Slopes NSS Lower Slopes
Prominent strike ridges and peaks on moderately folded Devonian rhyolite, dacite, tuff, quartz sandstone, siltstone and conglomerate, general elevation 350 to 770m, local relief 250m. Blakely's red gum (*Eucalyptus blakelyii*) and black cypress pine (*Callitris endlicheri*) on ridges, yellow box (*Eucalyptus melliodora*) and grey box (*Eucalyptus microcarpa*) on slopes.

Wer Weddin Range and Slopes NSS Lower Slopes

Prominent strike ridges, cliffs, peaks and benched slopes on moderately folded Devonian quartz sandstone, siltstone and conglomerate, general elevation 350 to 720m, local relief 250m. Thin stony uniform sands on crests and benches, deeper red brown loamy sand on slopes occasional red-brown texture-contrast soil. Crests with red ironbark (*Eucalyptus sideroxylon*), Blakely's red gum (*Eucalyptus blakelyii*), red stringybark (*Eucalyptus macrorhyncha*), white gum (Eucalyptus *rossii*), apple box (*Eucalyptus bridgesiana*), and tumble down red gum (*Eucalyptus dealbata*). Slopes with white box (*Eucalyptus albens*), yellow box (*Eucalyptus melliodora*), fuzzy box (*Eucalyptus conica*), and shrubby understorey of hopbush (*Dodonaea* spp.) and wattles (*Acacia* spp.). Foot slopes with white cypress pine (*Callitris glaucophylla*).

Meso: NSS Lower Slopes Basalts

Goo Goobothery Hills and Footslopes NSS Lower Slopes Basalts
Goobothery Hills and Footslopes landscape is made up of part of the *Goobothery* land system. Rounded and some linear ridges of Ordovician-Silurian phyllite, slate, sandstone, phyllite and siltstone with narrow incised drainage lines on lower slopes. General elevation 250m, local relief to 40 to 80m. The undulating to hilly country with lithosols supports dense Dwyer's mallee gum (*Eucalyptus dwyeri*) and currawang (*Acacia doratoxylon*), dense to scattered punty bush (*Cassia eremophila*.), needle wattle (*Acacia rigens*) and wedge-leaf hopbush (*Dodonaea viscosa*); wire grasses (*Aristida* spp.) and forbs.

Meso: NSS Lower Slopes Granites

Bbk Burrumbuttock Hills and Footslopes NSS Lower Slopes Granites
Rounded isolated hills with moderate slopes on Silurian-Devonian massive granite and granodiorite, general elevation 300 to 490m, local relief 80 to 100m. Coarse sandy red-brown earths with Dwyer's mallee gum (*Eucalyptus dwyeri*), white box (*Eucalyptus albens*) and currawang (*Acacia doratoxylon*).

Jhs Junee Hills and Slopes NSS Lower Slopes Granites
Rolling hills, low ranges and undulating plain on Silurian-Devonian massive granite and granodiorite, general elevation 300 to 450m, local relief 60m. Coarse siliceous sands amongst rock outcrop and tors, thin gritty red and yellow texture-contrast soils on slopes with harsh blocky subsoil. Woodland of Dwyer's red gum (*Eucalyptus dwyeri*) and red ironbark (*Eucalyptus sideroxylon*) on high rocky areas. On slopes open forest of; grey box (*Eucalyptus microcarpa*), red stringybark (*Eucalyptus macrorhyncha*) with patches of black cypress pine (*Callitris endlicheri*) in rocky outcrops. River red gum (*Eucalyptus camaldulensis*) and river oak (*Casuarina cunninghamiana*) along streams.

Man Manitoba Hills and Footslopes NSS Lower Slopes Granites
Manitoba Hills and Footslopes landscape includes parts of two land systems: *Manitoba* and *Warrowie*.
Low ridges with outcrops and tors of granite with narrow, incised drainage contributing to major creeks. General elevation 200 to 310m, local relief to 30m. Calcareous and neutral red earths with hills of shallow loamy and sandy lithosols with abundant surface grit grading into red earths down slope. Moderate to open Dwyer's mallee gum (*Eucalyptus dwyeri*), tumbledown gum (*Eucalyptus dealbata*), white cypress pine (*Callitris glaucophylla*), red box (*Eucalyptus polyanthemos*), kurrajongs (*Brachychiton populneus*), bimble box (*Eucalyptus populnea*), scattered western golden wattle (*Acacia decora*), variable spear grass (*Stipa* spp.), and wire grass (*Aristida* spp). River red gum (*Eucalyptus camaldulensis*) and bimble box along major creeks. Also mallee (*Eucalyptus* spp.), sugarwood (*Myaporum platycarpum*), grey box (*Eucalyptus microcarpa*), yarran (*Acacia homalophylla*), Dean's wattle (*Acacia deanei*), grasses and forbs.

Wae Warraderry Range NSS Lower Slopes Granites
Rounded moderately steep ranges and hills on Ordovician phyllite and schist intruded by Devonian granite, general elevation 350 to 570m, local relief 180m. Open forests of red ironbark (*Eucalyptus sideroxylon*), white cypress pine (*Callitris glaucophylla*), red stringybark (*Eucalyptus macrorhyncha*).

Meso: NSS Ultramafics

Tus Cootamundra - Tumut Serpentinite and Ultramafics NSS Ultramafics
Narrow ridges of extended linear outcrops of Devonian schistose serpentine, amphibolite and associated ultramafic rocks and sediments, general elevation 400 to 700m, local relief 120m. Dark structured clay loam and clay with unusual mineral content. No details available on vegetation but expected to be locally different and possibly to support rare species.

Meso: NSS Upper and Lower Slopes

Mtc Murrumbidgee - Tarcutta Channels and Floodplains NSS Upper and Lower Slopes
Channels, floodplain and terraces of Murrumbidgee tributaries on Quaternary alluvium, general elevation 200 to 400m, local relief 25m. Undifferentiated organic sand and loam on the floodplain, brown gradational loam and yellow texture-contrast soils on higher terraces. River red gum (*Eucalyptus camaldulensis*) gallery woodland on banks, yellow box (*Eucalyptus melliodora*) and grey box (*Eucalyptus microcarpa*) open woodland on floodplain and terraces.

Meso: NSS Upper Slopes

Adr Adrah Hills and Ranges NSS Upper Slopes
Rolling hills, low ranges and peaks on Ordovician quartzose greywacke, slate, phyllite and schist, general elevation 250 to 720m, local relief 200m. Stony, thin red and brown texture-contrast soils merging to yellow harsh texture-contrast soils on valley floors. Forest and woodland of; tumbledown red gum (*Eucalyptus dealbata*), red stringybark (*Eucalyptus macrorhyncha*), red ironbark (*Eucalyptus sideroxylon*), red box (*Eucalyptus polyanthemos*), grey box (*Eucalyptus microcarpa*), apple box (*Eucalyptus bridgesiana*) and broad-leaved stringybark (*Eucalyptus caliginosa*) on slopes, yellow box (*Eucalyptus melliodora*), white box (*Eucalyptus albens*) and occasional Blakely's red gum (*Eucalyptus blakelyii*) on flats with kangaroo grass (*Themeda triandra*) and plains grass (*Stipa aristiglumis*).

Bov Boorowa Volcanics NSS Upper Slopes
Undulating low hills and rocky rises on Silurian dacite, crystal tuff, andesite and minor sandstone, general elevation 550 to 650m, with peaks to 780m. Red and yellow gradational earths, and yellow structured loams, thin stony loams within rock outcrops. Grassy woodland of yellow box (*Eucalyptus melliodora*), grey box (*Eucalyptus microcarpa*), Blakely's red gum (*Eucalyptus blakelyii*), red stringy bark (*Eucalyptus macrorhyncha)* and occasional kurrajong (*Brachychiton populneus*).

Cnb Canobolas Slopes NSS Upper Slopes
Strike ridges, rounded hills, peaks and ranges on variable Ordovician-Silurian felspathic sandstone, tuffaceous sandstone and thin limestone units, Silurian lithic sandstone, quartz sandstone, tuff and quartz-felspar porphyry, Silurian-Devonian granite. General elevation 500 to 900m local relief 100m. Marked altitudinal shift in vegetation associations as rainfall declines to the west. Red and yellow earth and yellow texture-contrast soils in the east with grassy woodlands of; yellow box (*Eucalyptus melliodora*), grey box (*Eucalyptus microcarpa*), Blakely's red gum (*Eucalyptus blakelyii*), apple box (*Eucalyptus bridgesiana*), and broad-leaved peppermint (*Eucalyptus dives*). Brown gradational sandy loam and harsh

yellow texture-contrast soils in the west with woodlands and grassy open forest of; white box (*Eucalyptus albens*), grey box, red ironbark (*Eucalyptus sideroxylon*), red stringybark (*Eucalyptus macrorhyncha*), with yellow box and rough-barked apple (*Angophora floribunda*) on the flats and river oak (*Casuarina cunninghamiana*) along the streams.

Cbt Carabost Hills and Ranges NSS Upper Slopes
Steep dipping Lower Ordovician chert, slate, lithic sandstone, shale, phyllite schist and minor basic volcanic rocks General elevation 250 to 720m, local relief 250m. Thin stony gradational red brown earth and red-yellow texture-contrast soils. Dry forest of red stringybark (*Eucalyptus macrorhyncha*) and broad-leaved peppermint (*Eucalyptus dives*).

Cdc Cudgegong Channels and Floodplains NSS Upper Slopes
Channels, floodplains and terraces on Quaternary alluvium, general elevation 450 to 600m, local relief 30m. Undifferentiated loam and sandy loam on the floodplains, dark gradational loams on low terraces and re-yellow texture-contrast profiles on high terrace remnants against steep hill slopes. River oak (*Casuarina cunninghamiana*) along the streams, yellow box (*Eucalyptus melliodora*), rough barked apple (*Angophora floribunda*) on floodplains and terraces with grassy understorey.

Epl Eugowra Plains NSS Upper Slopes
Alluvial plains and lower hill slopes of Lachlan River terraces and tributary valleys on Quaternary alluvium. General elevation 250 to 300m, local relief 15m. Extensive red-brown earths and cracking clay soils. Extensively cleared and farmed originally carried white cypress pine (*Callitris glaucophylla*) and grey box (*Eucalyptyus microcarpa*) with yellow box (*Eucalyptus melliodora*) communities and river red gum (*Eucalyptus camaldulensis*) adjacent to stream lines. Includes small areas of low bedrock hills.

Frh Frampton Hills NSS Upper Slopes
Rounded ranges and hills with moderate slopes on Silurian slate, jasper, chert, amphibolite, and Devonian dacite and mudstone, general elevation 400 to 720m, local relief 100m. Shallow stony red brown structured loam. Open forest of grey box (*Eucalyptus microcarpa*), red stringybark (*Eucalyptus macrorhyncha*), red ironbark (*Eucalyptus sideroxylon*), Blakely's red gum (*Eucalyptus blakelyii*) and black cypress pine (*Callitris endlicheri*).

Glr Gulgong Ranges NSS Upper Slopes
Strike ridges with steep slopes and long debris aprons on complexly folded steep dipping Silurian lithic sandstone, quartzite and phyllite, Devonian sandstone, siltstone, shale, rhyolite and dacite. General elevation 550 to 980m, local relief 350m. Shallow stony red and yellow texture-contrast soils with stony uniform loams on step slopes. Large areas of dense black cypress pine (*Callitris endlicheri*) on slopes, red stringybark (*Eucalyptus macrorhyncha*) and white gum (*Eucalyptus rossii*) on ridges. Blakely's red gum (*Eucalyptus blakelyii*), narrow-leaved peppermint (*Eucalyptus radiata*) and white box (*Eucalyptus albens*) on lower slopes grading to yellow box (*Eucalyptus melliodora*).

Guh Gumble Hills NSS Upper Slopes
Rolling hills with large tors and bouldery outcrop on Devonian granite with small areas of Tertiary(?) cemented sand and gravel. General elevation 550 to 680m, local relief 40m. Shallow gritty uniform sand below rock outcrops, dull yellow and grey harsh texture-contrast soils on slopes, yellow earths on Tertiary sands. Dense black cypress pine (*Callitris endlicheri*), tumbledown red gum (*Eucalyptus dealbata*), red stringybark (*Eucalyptus macrorhyncha*), red ironbark (*Eucalyptus sideroxylon*) with dense shrubby understorey including *Grevillea floribunda*.

Har Harvey Ranges and Slopes NSS Upper Slopes

Prominent strike ridges and ranges with structurally controlled dip slope and escarpment features on folded, moderately dipping Devonian conglomerate, sandstones, shale, rhyolite and dacite. General elevation 400 to 770m, local relief 300m. Thin sands on crests amongst abundant rock outcrop. Shallow red texture-contrast soils on shale benches, bouldery debris slopes with sandy loam matrix merging with red-brown earths on lower slopes with sand and gravel in streambeds. Woodlands and low forest of tumbledown red gum (*Eucalyptus dealbata*), red stringybark (*Eucalyptus macrorhyncha*), black cypress pine (*Callitris endlicheri*), red ironbark (*Eucalyptus sideroxylon*), patches of green mallee (*Eucalyptus viridis*) and heath on crests. Blakely's red gum (*Eucalyptus blakelyii*), and white cypress pine (*Callitris. glaucophylla*) on lower slopes, yellow box (*Eucalyptus melliodora*) on streams and flats.

Lgg Lachlan Gorge NSS Upper Slopes

Steep sided gorge on upper Lachlan River and tributaries which intersects north-south striking ridges on Ordovician slate, greywacke, tuff, chert and dacite, Silurian shale, gneissic granite and Devonian sandstone. General elevation 500 to 700m, local relief 80 to 120m. Thin sandy loam in rock outcrop with limited development of red or yellow texture-contrast soil on benches and small terrace remnants, sand and gravel in streambeds. Red box (*Eucalyptus polyanthemos*), apple box (*Eucalyptus bridgesiana*), red stringybark (*Eucalyptus macrorhyncha*), black cypress pine (*Callitris endlicheri*) and tumbledown red gum (*Eucalyptus dealbata*), river oak (*Casuarina cunninghamiana*) along stream banks.

Ltg Lachlan Terrace Gravels NSS Upper Slopes

Limited area of high terrace on Tertiary quartz gravel and sand, general elevation 350m, local relief 15m. Gravelly red earth uniform profile. Grassy woodland of black cypress pine (*Callitris endlicheri*) and red

Mah Manna Hills and Footslopes NSS Upper Slopes

Isolated low rounded hills, foot slopes and wide colluvial aprons on the Lachlan alluvial plain adjacent to the *Ardlethan* land system. Silurian and Devonian lithic sandstones and conglomerates, general elevation 400 to 490m, local relief 60 to 80m. Stony read earth and calcareous red earth, uniform and gradational profiles. Woodland of bimble box (*Eucalyptus populnea*), white cypress pine (*Callitris glaucophylla*), Dwyer's mallee gum (*Eucalyptus dwyeri*), red ironbark (*Eucalyptus sideroxylon*), patches of white mallee (*Eucalyptus dumosa*) and red mallee (*Eucalyptus socialis*), western black wattle (*Acacia hakeoided*), western golden wattle (*Acacvia decora*), spear grasses (*Stipa* spp.) and wire grass (*Aristida* spp.).

Mbr Marilba Range NSS Upper Slopes

Steep strike ridges on steep dipping Devonian rhyolite, dacite, andesite, tuff and shale, general elevation 550 to 840m, local relief 150m. Thin brown loams in rock outcrop grading to red-yellow harsh texture-contrast soil on the slopes. Open grey box (*Eucalyptus microcarpa*), red stringybark (*Eucalyptus macrorhyncha*), red ironbark (*Eucalyptus sideroxylon*), black cypress pine (*Callitris endlicheri*) and tumbledown gum (*Eucalyptus dealbata*). Yellow box (*Eucalyptus melliodora*) and limited river red gum (*Eucalyptus camaldulensis*) along streams.

Min Minjary Hills and Ranges NSS Upper Slopes

Steep hills and ranges on lower Silurian sandstone, greywacke, quartzite, dacite, tuff, and phyllite, and Devonian ignimbrite and sandstone, general elevation 300 to 930m, local relief 400m. Rubbly scree with sandy loam matrix on steep slopes, thin red to yellow texture-contrast soils on lower slopes. Open forest of; grey box (*Eucalyptus microcarpa*), white box (*Eucalyptus albens*), apple box (*Eucalyptus bridgesiana*), red stringybark (*Eucalyptus macrorhyncha*), red ironbark (*Eucalyptus sideroxylon*), tumbledown gum (*Eucalyptus dealbata*), broad-leaved peppermint (*Eucalyptus dives*), black cypress pine (*Callitris endlicheri*) with grasses and shrubs.

Mor Molong Ridges NSS Upper Slopes

Steep hills and strike ridges on tightly folded Devonian quartz and lithic sandstones, shale and conglomerate with some limestone, minor chert and tuff, general elevation 530 to 780m, local relief 200m. Stony uniform sand and loam in extensive rock outcrop along crests and upper slopes, stony brown texture-contrast soil on lower slopes, red harsh texture-contrast soil on flanks, gravel in stream beds. Black cypress pine (*Callitris endlicheri*), Blakely's red gum (*Eucalyptus blakelyii*), red stringybark (*Eucalyptus macrorhyncha*) and red ironbark (*Eucalyptus sideroxylon*) with numerous shrubs on crests, grey box (*Eucalyptus microcarpa*), apple box (*Eucalyptus bridgesiana*) and white box (*Eucalyptus albens*) on slopes, yellow box (*Eucalyptus melliodora*) and grey box on flats, river red gum (*Eucalyptus camaldulensis*) and river oak (*Casuarina cunninghamiana*) on larger streams, scattered kurrajong (*Brachychiton populneus*) and white box on limestones.

Mls Mullion Slopes NSS Upper Slopes

Steep hills and strike ridges on tightly folded Ordovician andesite, conglomerate and tuff, Silurian rhyolite and shale, Devonian quartz sandstones, slate and minor limestone, general elevation 500 to 830m, local relief 200m. Stony uniform sand and loam in extensive rock outcrop along crests, stony red and brown texture-contrast soil on slopes, yellow harsh texture-contrast soil in valleys with some evidence of salinity. Gravel and sand in streambeds. Open forest to woodland of; white gum (*Eucalyptus rossii*), brittle gum (*Eucalyptus mannifera*), broad-leaved peppermint (*Eucalyptus dives*), red box (*Eucalyptus polyanthemos*), mountain grey gum (*Eucalyptus cypellocarpa*), white box (*Eucalyptus albens*) with yellow box (*Eucalyptus melliodora*) on lower slopes and river oak (*Casuarina cunninghamiana*) along the streams.

Nar Nangar Ranges NSS Upper Slopes

Steep structurally controlled ridges and peaks with low cliffs on Devonian and Silurian lithic sandstones, shales and occasional conglomerates. Small areas of granitic intrusions. Strong dendritic drainage pattern. General elevation 500 to 770m, local relief to 300m. Shallow stony soils on steep slopes with rubbly debris in gully lines, yellow texture-contrast soils on lesser slopes. Grey box (*Eucalyptus microcarpa*) woodlands with red stringybark (*Eucalyptus macrorhyncha*), red ironbark (*Eucalyptus sideroxylon*) and tumbledown gum (*Eucalyptus dealbata*). Black cypress pine (*Callitris endlicheri*) common on stony sites with white cypress pine (*Callitris glaucophylla*) in lower positions on better soils. Numerous acacia and shrubs.

Ohp Ophir - Hargraves Plateau NSS Upper Slopes

Subdued strike ridges and dissected plateau on tightly folded Silurian and Devonian dacite, tuffaceous greywacke, crystal tuff, lithic sandstone and slate, general elevation 500 to 1000m, local relief100 to 150m. Abundant rock outcrop with thin sandy loam grading to thin stony red texture-contrast soil on slopes and yellow harsh texture-contrast soil with bleached A_2 horizons in valleys. Woodland to open forest of broad-leaved peppermint (*Eucalyptus dives*), red stringybark (*Eucalyptus macrorhyncha*), scribbly gum (*Eucalyptus rossii*), candlebark (*Eucalyptus rubida*), and yellow box (*Eucalyptus melliodora*) in lower positions. More northerly areas include red box (*Eucalyptus polyanthemos*), mountain grey gum (*Eucalyptus cypellocarpa*) and apple box (*Eucalyptus bridgesiana*).

Ttr Table Top Range NSS Upper Slopes

Isolated hills with low to moderates slopes on Devonian conglomerate, sandstone and shale, general elevation 200 to 445m, local relief 100m. Shallow sandy red texture-contrast soils with woodland and low forest of tumbledown red gum (*Eucalyptus dealbata*), red stringybark (*Eucalyptus macrorhyncha*), black cypress pine (*Callitris endlicheri*) and red ironbark (*Eucalyptus sideroxylon*), yellow box (*Eucalyptus melliodora*) on flats, river red gum (*Eucalyptus camaldulensis*) along larger streams.

Tab Talbragar - Upper Macquarie Terrace Sands and Gravels NSS Upper Slopes
Sandy Quaternary alluvial sediments on the floodplains and terraces of the Talbragar River, general elevation 350 to 500m, local relief 30 to 40m. Red-brown and red-yellow earthy sands with some yellow texture-contrast soils on the valley margins. River red gum (*Eucalyptus camaldulensis*) along the channels, yellow box (*Eucalyptus melliodora*) and rough-barked apple (*Angophora floribunda*) with white cypress pine (*Callitris glaucophylla*) on the plain.

Tum Tumut Channels and Floodplain NSS Upper Slopes
Channel, floodplain and remnant terraces of Quaternary alluvium, general elevation 300 to 350m, local relief 25m. Gravel streambed, uniform dark brown loam on the floodplain, yellow texture-contrast soil and rubbly loams on terraces and valley margins. River red gum (*Eucalyptus camaldulensis*) along the stream, yellow box (*Eucalyptus melliodora*) on the valley floor.

Uls Ulandra - Narrabulla Hills and Slopes NSS Upper Slopes
Rounded hills and isolated peaks on Silurian-Devonian granite, granodiorite and granite gneiss, general elevation 300 to 930m, local relief 300m. Abundant rock outcrop, thin gritty loams and shallow red-brown texture-contrast soils. Woodland of red stringybark (*Eucalyptus macrorhyncha*), Blakely's red gum (*Eucalyptus blakelyii*), black cypress pine (*Callitris endlicheri*), white box (*Eucalyptus albens*), yellow box (*Eucalyptus melliodora*), long-leaved box (*Eucalyptus nortonii*) and red box (*Eucalyptus polyanthemos*), with high diversity of shrubs including Cootamundra wattle (*Acacia baileyana*).

Ulc Upper Lachlan Channels and Floodplains NSS Upper Slopes
Upper reaches of the Lachlan River passing through the central western tablelands to the floodplains on the western slopes. The stream pattern cuts across the geologic structure forming several narrow gorge sections with rocky walls and limited deposits of gravel alluvium. River oak (*Casuarina cunninghamiana*) dominant with river red gum (*Eucalyptus camaldulensis*) and yellow box (*Eucalyptus melliodora*) becoming more common along the downstream reaches.

Won Wonga Hills and Ranges NSS Upper Slopes
Rolling hills, low rises and ridges on Ordovician siltstone, slate, quartzite and phyllite, general elevation 250 to 370m, local relief 50m. Stony, thin red and brown texture-contrast soils merging to yellow harsh texture-contrast soils on valley floors. High salinity in the subsoil and some brackish flows in small creeks. Woodlands of; tumbledown red gum (*Eucalyptus dealbata*), red stringybark (*Eucalyptus macrorhyncha*) and grey box (*Eucalyptus microcarpa*) on slopes, yellow box (*Eucalyptus melliodora*), white box (*Eucalyptus albens*) and occasional Blakely's red gum (*Eucalyptus blakelyii*) on flats with kangaroo grass (*Themeda triandra*) and plains grass (*Stipa aristiglumis*).

Bog Bodangora Granite NSS Upper Slopes
Isolated rounded mountain peak with common rock outcrop and tors on Carboniferous granite and granodiorite, general elevation 500 to 740m, local relief 180m. Gritty gradational red earth on the crest and red texture-contrast soil on the slopes. Forest of yellow box (*Eucalyptus melliodora*), Blakely's red gum (*Eucalyptus blakelyii*), red stringybark (*Eucalyptus macrorhyncha*), apple box (*Eucalyptus bridgesiana*), mountain gum (*Eucalyptus dalrympleana*) and black cypress pine (*Callitris endlicheri*).
NSS Upper Slopes Basalts

Wob Woodstock Basalts NSS Upper Slopes Basalts
Rolling low hills on Ordovician andesite, tuff volcanic breccia and minor basalt, general elevation 500 to 600m, local relief 50m. Gradational brown structured loam to red-brown

earth and yellow harsh texture-contrast soil along valley floors. Woodland of grassy white box (*Eucalyptus albens*) with minor grey box (*Eucalyptus microcarpa*), red ironbark (*Eucalyptus sideroxylon*) and red stringybark (*Eucalyptus macrorhyncha*), occasional apple box (*Eucalyptus bridgesiana*) and rough-barked apple (*Angophora floribunda*).

Meso: NSS Upper Slopes Granites

Adl Adelong Granite Ranges NSS Upper Slopes Granites
Steep hills and peaks on and Silurian gneissic granite and Devonian massive granite, general elevation 500 to 760m, local relief 200m. Coarse loamy sand between rock outcrops and in crevices, then gritty gradational profiles developing to yellow harsh texture-contrast soils on lower slopes. Forests of yellow box (*Eucalyptus melliodora*), red stringybark (*Eucalyptus macrorhyncha*), brittle gum (*Eucalyptus mannifera*), black cypress pine (*Callitris endlicheri*) and white gum (*Eucalyptus rossii*).

Cof Coffin Rock Granite Hills NSS Upper Slopes Granites
Rolling to steep rocky hills with broad crests on granite. General elevation 300 to 440m, local relief <50m. Coarse gritty red and brown texture-contrast soils on crests and slopes merging to yellow harsh texture-contrast or gradational soils on flats. Woodlands of; tumbledown red gum (*Eucalyptus dealbata*), red ironbark (*Eucalyptus sideroxylon*), red stringybark (*Eucalyptus macrorhyncha*), white gum (*Eucalyptus rossii*), Blakely's red gum (*Eucalyptus blakelyii*) and white cypress pine (*Callitris glaucophylla*) with kangaroo grass (*Themeda triandra*) and plains grass (*Stipa aristiglumis*).

Cop Cope Hills Granite NSS Upper Slopes Granites
Undulating and rolling hills on Carboniferous granite and granodiorite, general elevation 500 to 740m, local relief 150m. Gritty gradational red earth and red texture-contrast soils. Forest of yellow box (*Eucalyptus melliodora*), Blakely's red gum (*Eucalyptus blakelyii*), red stringybark (*Eucalyptus macrorhyncha*), apple box (*Eucalyptus bridgesiana*), mountain gum (*Eucalyptus dalrympleana*) and black cypress pine (*Callitris endlicheri*).

Geg Geurie Granites NSS Upper Slopes Granites
Low ranges and rounded hills with common rock outcrop and tors on massive Devonian granite, general elevation 400 to 610m, local relief 180m. Gritty gradational red earth on the crests, red texture-contrast soil on upper slopes grading to yellow harsh texture-contrast soil along valley floors. Open forest of; red ironbark (*Eucalyptus sideroxylon*), white cypress pine (*Callitris glaucophylla*), red stringybark (*Eucalyptus macrorhyncha*), yellow box (*Eucalyptus melliodora*), Blakely's red gum (*Eucalyptus blakelyii*), and a shrubby understorey.

Tip Tipperary Hills Granites NSS Upper Slopes Granites
Rounded hills and peaks on Silurian massive and gneissic granite with some gneiss and schist, general elevation 400 to 930m, local relief 350m. Gritty gradational red earths and red texture-contrast soils. Forest of yellow box (*Eucalyptus. melliodora*), grey box (*Eucalyptus microcarpa*), Blakely's red gum (*Eucalyptus blakelyii*), red stringybark (*Eucalyptus macrorhyncha*), red box (*Eucalyptus polyanthemos*), apple box (*Eucalyptus bridgesiana*), broad-leaved peppermint (*Eucalyptus dives*) and black cypress pine (*Callitris endlicheri*). River red gum (*Eucalyptus camaldulensis*) along streams.

Wyh Wyangla Hills NSS Upper Slopes Granites
Rounded hills, some steep slopes and partly dissected plateau with tors and massive outcrop on Silurian massive and gneissic granite with some gneiss and schist, general elevation 400 to 750m, local relief 200m. Thin loamy sand between outcrops, red texture-contrast soils on uppers lopes grading to yellow texture-contrast soils on lower slopes and accumulation of siliceous coarse sands along streams. Open woodland of yellow box (*Eucalyptus melliodora*), red stringybark (*Eucalyptus macrorhyncha*), broad-leaved peppermint (*Eucalyptus dives*) and

Blakely's red gum (*Eucalyptus blakelyii*) with kangaroo grass (*Themeda triandra*) and *Poa* sp., mostly cleared and grazed. Patches of black cypress pines (*Callitris endlicheri*) on rocky peaks.

Yos Young Hills and Slopes NSS Upper Slopes Granites
Rounded hills and some steep slopes to tor covered ridges on massive and gneissic Silurian-Devonian granites and granodiorite, general elevation 400 to 730m, local relief 100 to 250m. Gradational red earths on upper slopes and red-yellow texture-contrast soils on lower slopes reflecting poorer drainage. Extensively cleared with patches of remaining woodland of white box (*Eucalyptus albens*), yellow box (*Eucalyptus melliodora*), broad-leaved peppermint (*Eucalyptus dives*), red stringybark (*Eucalyptus macrorhyncha*) and Blakely's red gum (*Eucalyptus blakelyii*).

RIV - Descriptions for Landscapes in the Riverina Bioregion

Meso: RIV Lachlan

Lac Lachlan Channels and Floodplains RIV Lachlan
Lachlan Channels and Floodplains landscape includes parts of seven land systems: *Kiacatoo*, *Kilfera*, *Lachlan*, *Lowbidgee*, *Murrumbidgee*, *Pangee* and *Riverland*.

Quaternary alluvium on floodplains, active and inactive channels, billabongs, levees, swamps and source bordering dunes of the Lachlan River and its effluent streams. Some areas of associated sandplain, remnant lunettes, and slightly higher river terraces. Relief 2 to 10m. Grey, red and brown cracking clays on lakes and plains, red, yellow and brown texture-contrast soils on levees. Deep self-mulching and cracking clays in channels, low rises of deep brownish sands and solonized brown soils; fluvial backplains of scalded yellow texture-contrast soils. Prior streams and lunettes of loamy red texture-contrast soils and calcareous earths.

River red gum *(Eucalyptus camaldulensis*) and river cooba (*Acacia stenophylla*) with grasses along channels. Nardoo (*Marsilea drummondii*), common reed (*Phragmites australis*) and cumbungi (*Typha orientalis*) in waterholes. Abundant lignum (*Muehlenbeckia cunninghamii*) and canegrass (*Eragrostis australasica*) with black box *(Eucalyptus largiflorens*), myall (*Acacia pendula*), rosewood (*Alectryon oleifolius*), burrs and grasses on grey soils. Myall (*Acacia pendula*), cottonbush (*Maireana aphylla*) and annual grasses on levees. Extensive areas of treeless plain away from the channels with bladder saltbush (*Atriplex vesicaria*), old man saltbush (*Atriplex nummularia*), nitre goosefoot (*Chenopodium nitrariaceum*), lignum, dark roly-poly (*Sclerolaena muricata*) and grasses. Terraces with dense black box, lignum, old man saltbush and nitre goosefoot. Sandplains and hummocks with scattered to clumped dillon bush (*Nitraria billardierei*) and bluebush (*Maireana* sp.). Sandy rises, lunettes and backplains of clumped mallee *(Eucalyptus* sp.) white cypress pine (*Callitris glaucophylla*), prickly wattle (*Acacia victoriae*) and scattered shrubs. Belah (*Casuarina cristata*), white cypress pine, and needlewood (*Hakea leucoptera*) on rare dunes.

Ldp Lachlan Depression Plains RIV Lachlan
Lachlan Depression Plains landscape includes parts of the *Willandra* land system.

Quaternary alluvial plains with numerous circular depressions interpreted as high floodplains or low terraces beyond the reach of average floodwaters. Sandy rises and levees trace ancestral streams and stand above the general plain, relief 1 to 3m. Grey and brown cracking

and non-cracking clays often with gilgai on the plains. Sands and red or brown texture-contrast soils on the higher ground.

Isolated black box *(Eucalyptus largiflorens*), patches of myall (*Acacia pendula*) and prickly wattle (*Acacia victoriae*) on the eastern plains with annual saltbushes (*Atriplex* sp.) and grasses. Scattered white cypress pine (*Callitris glaucophylla*), rosewood (*Alectryon oleifolius*), belah (*Casuarina cristata*), wilga (*Geijera parviflora*), narrow-leaf hopbush (*Dodonaea attenuata*) and grasses on sands. Bladder saltbush (*Atriplex vesicaria*), annual saltbush, burrs and grasses on scalded levees.

Lss Lachlan Lakes, Swamps and Lunettes RIV Lachlan

Lachlan Lakes, Swamps and Lunettes landscape includes parts of nine land systems: *Cargelligo, Gulthul, Gunnaramby, Lowbidgee, Mungo, Murrumbidgee, Riverland, Yanga* and *Youhl.*

Quaternary alluvium in lakebeds, swamps, salinas, shorelines, lunettes, feeder channels and terraces of the river wetlands. Associated extensive sandplains and dunes. Relief to 7m. Includes large relict lakes upstream of the Mungo system partially overlain by sandplains and unstable dunes, flanked by high unstable lunettes, relief to 30m. Grey cracking clays with gilgai on active lake beds and channels. Calcareous red earths on shorelines and shallow sandy calcareous soils, or deep brownish sands and solonized brown soils on lunettes. Red-brown or grey, often saline clays on relic lakebeds. Sandplains of loamy to clay loam calcareous earths with limestone nodules frequently exposed, dunes of deep red, yellow or white sands. Prior streams and relic lunettes of loamy red texture-contrast soils and calcareous earths.

Lake beds often flooded and treeless, with fringing black box *(Eucalyptus largiflorens*), lignum (*Muehlenbeckia cunninghamii*), nitre goosefoot (*Chenopodium nitrariaceum*), yanga bush (*Maireana brevifolia*), and old man saltbush (*Atriplex nummularia*). Lake margins, lunettes and terraces with scattered bimble box *(Eucalyptus populnea*), black box, white cypress pine (*Callitris glaucophylla*), river cooba (*Acacia stenophylla*), dense areas of yanga bush and abundant grasses. Floodplains and channels with river red gum *(Eucalyptus camaldulensis*), scattered bladder saltbush (*Atriplex vesicaria*), cottonbush (*Maireana aphylla*), canegrass (*Eragrostis australasica*) and abundant grasses. Sandplains and dunes of dense mallee *(Eucalyptus* sp.) scattered to clumped belah (*Casuarina cristata*), rosewood (*Alectryon oleifolius*), needlewood (*Hakea leucoptera*), porcupine grass (*Triodia irritans*), saltbushes (*Atriplex* sp.), bluebush (*Maireana* sp.) and grasses. Relic lunettes carry dense stands of black bluebush (*Maireana pyramidata*), pearl bluebush (*Maireana sedifolia*), and isolated white cypress pine or mallee.

Lpl Lachlan Sandplains RIV Lachlan

Lachlan Sandplains landscape includes parts of three land systems: *Hatfield, Overnewton* and *Gulthul.*

Extensive slightly undulating Quaternary aeolian sands with isolated sandy hummocks and depressions, relief 4 to 8m. Loamy to clay loam calcareous earths with limestone nodules frequently exposed, solonized brown soils and sandy red and brown texture-contrast soils, deep red sands on hummocks and dunes, grey clays in depressions.

Scattered clumps of white cypress pine (*Callitris glaucophylla*), rosewood (*Alectryon oleifolius*), and belah (*Casuarina cristata*), moderate to dense stands of black (*Maireana pyramidata*) or pearl bluebush (*Maireana sedifolia*). Abundant short grasses and forbs, turpentine (*Eremophila sturtii*), narrow-leaf hopbush (*Dodonaea attenuata*), variable spear grass (*Austrostipa variabilis*), bottlewashers (*Enneapogon* sp.), cannonball (*Sclerolaena*

paradoxa), copperburr (*Sclerolaena* sp.). Isolated black box *(Eucalyptus largiflorens*) around depressions.

Lsp Lachlan Scalded Plains RIV Lachlan

Lachlan Scalded Plains landscape includes parts of four land systems: *Marma, Oxford, Pangee* and *Rata.*

Quaternary alluvial plains with extensive scalding interpreted as relic floodplains or terraces. Grey, brown and red cracking clays, red brown texture-contrast soils with scalds. Levees traces evident, relief generally <1m, up to 5m on associated pans, swamps and lunettes.

Extensive bladder saltbush (*Atriplex vesicaria*), cottonbush (*Maireana aphylla*), and dillon bush (*Nitraria billardierei*), clumps of old man saltbush (*Atriplex nummularia*) with annual saltbushes (*Atriplex* sp.) and grasses on the clay plains. Isolated yarran (*Acacia homalophylla*) and scattered to dense black bluebush (*Maireana pyramidata*) with burrs and grasses on texture-contrast soils of the levees and rises.

Meso: RIV Murray

Muc Murray Channels and Floodplains RIV Murray

Murray Channels and Floodplains landscape includes parts of four land systems: *Canally, Murrumbidgee, Riverland* and *Wentworth.*

Active channels and seasonally inundated floodplains of the Murray streams in Quaternary alluvium with associated billabongs, swamps, channels, levees and source bordering dunes, relief to 10m. Includes sca1ded alluvial flats, broad elevated floodplains and associated relict channels; isolated sandy rises, relief to 5m.

Channel banks of grey and brown clays with river red gum *(Eucalyptus camaldulensis*), black box *(Eucalyptus largiflorens*), and river cooba (*Acacia stenophylla*). River red gum around billabongs with dense lignum (*Muehlenbeckia cunninghamii*), common reed (*Phragmites australis*) and cumbungi (*Typha orientalis*). Flats of silty or cracking grey clays, rimmed with black box, lignum, and canegrass (*Eragrostis australasica*). Highest flooded terrace with brown clays or red-brown texture-contrast soils carry yellow box *(Eucalyptus melliodora*). Dunes and sandplains of deep sandy brown soils or texture-contrast soils, locally calcareous, with belah (*Casuarina cristata*), white cypress pine (*Callitris glaucophylla*), mallee *(Eucalyptus* sp.) rosewood (*Alectryon oleifolius*), needlewood (*Hakea leucoptera*) and marginal clumps of black box, belah, prickly wattle (*Acacia victoriae*) over bluebush (*Maireana* sp.) and grasses.

Mdp Murray Depression Plains RIV Murray

Quaternary alluvial plains with numerous circular depressions interpreted as high floodplains or low terraces beyond the reach of average floodwaters. Grey and brown cracking and non-cracking clays often with gilgai on the plains. Sandy rises and levees trace ancestral streams and stand above the general plain, relief 1 to 3m. Sands and red or brown texture-contrast soils on the higher ground.

Isolated black box *(Eucalyptus largiflorens*), patches of myall (*Acacia pendula*) and prickly wattle (*Acacia victoriae*) with annual saltbushes (*Atriplex* sp.) and grasses. Scattered white cypress pine (*Callitris glaucophylla*), rosewood (*Alectryon oleifolius*), belah (*Casuarina cristata*), wilga (*Geijera parviflora*), narrow-leaf hopbush (*Dodonaea attenuata*) and grasses on sands. Bladder saltbush (*Atriplex vesicaria*), annual saltbush, burrs and grasses on scalded levees. Mostly cleared, cropped and grazed.

Mll Murray Lakes, Swamps and Lunettes RIV Murray

Murray Lakes, Swamps and Lunettes landscape includes parts of two land systems: *Leaghur* and *Victoria.*

Large active freshwater lakes and swamps frequently flooded by the river, generally round or kidney shaped. Often nested within larger relic Quaternary lake features. Beaches, sand and clay pellet lunettes and sand hills on the eastern margins. Lake beds and associated channels of grey cracking clay, beaches of brown to white sands, lunettes of deep cemented yellow to white sands, with or without interbedded strata of pelleted clay. Relief of lakes and channels to 10m, lunettes to 20m.

Scattered black box *(Eucalyptus largiflorens*), river red gum *(Eucalyptus camaldulensis*), nitre goosefoot (*Chenopodium nitrariaceum*) and lignum (*Muehlenbeckia cunninghamii*) on lakebeds. Shallower swamps with cumbungi (*Typha orientalis*), common reed (*Phragmites australis*), spike rush (*Eleocharis* sp.) and water couch (*Paspalum paspalodes*). Numerous aquatic plants in standing water. Lunettes and sand hills with marginal river red gum, and stands of white cypress pine (*Callitris glaucophylla*), prickly wattle (*Acacia victoriae*), sandhill wattle (*Acacia ligulata*), bluebush (*Maireana* sp.) and grasses.

Msl Murray Scalded Plains RIV Murray

Quaternary alluvial plains with extensive scalding interpreted as relic floodplains, terraces or part of the Cadell tilt block. Red brown texture-contrast soils with extensive scalds. Prior stream channels of deep coarse sands with sandy levees and grey, brown and red cracking clays in depressions, relief 5 to 15m.

Mostly cleared, cropped and grazed. Formerly open woodland and grasslands of white cypress pine (*Callitris glaucophylla*), grey box *(Eucalyptus microcarpa*), bull oak (*Allocasuarina luehmannii*), and myall (*Acacia pendula*) with annual grasses and herbs.

Msd Murray Source-bordering Dunes RIV Murray

Sandy rises adjacent to river channels or prior streambeds, deep red and brown sands and loams, relief 3 to 12m. Often heavily grazed and subject to wind erosion.

White cypress pine (*Callitris glaucophylla*), needlewood (*Hakea leucoptera*), hooked needlewood (*Hakea tephrosperma*), wilga (*Geijera parviflora*), bull oak (*Allocasuarina luehmannii*), emu bush (*Eremophila longifolia*), miljee (*Acacia oswaldii*), yarran (*Acacia homalophylla*), native quince (*Petalostigma pubescens*), and narrow leaf hopbush (*Dodonaea attenuata*) with sparse grasses.

Meso: RIV Murrumbidgee

Mbc Murrumbidgee Channels and Floodplains RIV Murrumbidgee

Murrumbidgee Channels and Floodplains landscape includes parts of three land systems: *Murrumbidgee, Lowbidgee* and *Riverland.*

Quaternary alluvium on seasonally inundated floodplains, active and inactive channels, billabongs, levees and swamps of the Murrumbidgee River and its effluent streams. Relief to 10m. Includes sca1ded alluvial flats, broad elevated floodplains and associated relict channels; isolated sandy rises, relief to 5m. Grey and brown clay with occasional areas of low sandy rise.

Open forest of river red gum *(Eucalyptus camaldulensis*), river cooba (*Acacia stenophylla*), cooba (*Acacia salicina*), lignum (*Muehlenbeckia cunninghamii*), nitre goosefoot (*Chenopodium nitrariaceum*) with numerous grasses along the channels and floodplain. Black box *(Eucalyptus largiflorens*) woodland with lignum, nitre goosefoot, thorny saltbush (*Rhagodia* sp*inescens*), old man saltbush (*Atriplex nummularia*) and annual saltbushes

(*Atriplex* sp.) on more distal floodplains and back plains. Cumbungi (*Typha orientalis*), common reed (*Phragmites australis*) and nardoo (*Marsilea drummondii*) in flooded depressions.

Mud Murrumbidgee Depression Plains RIV Murrumbidgee
Quaternary alluvial plains with numerous circular depressions interpreted as high floodplains or low terraces beyond the reach of average floodwaters, relief to 10m. Grey to brown clays and clay loams with linear patterns of sandy prior streams.

Now extensive grasslands of white-top, windmill grass, sand broom, and spear grasses, heavily grazed and invaded by exotic species. Reported to have originally been myall (*Acacia pendula*), old man saltbush (*Atriplex nummularia*) and bladder saltbush (*Atriplex vesicaria*). Sandy ridges of prior streams support patches of white cypress pine (*Callitris glaucophylla*), with needlewood (*Hakea leucoptera*), western pittosporum (*Pittosporum phylliraeoides*) and spear grasses (*Austrostipa* sp.).

Mbl Murrumbidgee Lakes, Swamps and Lunettes RIV Murrumbidgee
Murrumbidgee Lakes, Swamps and Lunettes landscape includes parts of the *Cargelligo* land system.

Large active freshwater lakes and swamps frequently flooded by the river, sometimes near permanent, generally round or kidney shaped. Often nested within larger relic Quaternary lake features. May include areas of saline plains. Beaches, sand and clay pellet lunettes and sand hills on the eastern margins. Lake beds and associated channels of grey cracking clay, beaches of brown to white sands, lunettes of deep cemented yellow to white sands, with or without interbedded strata of pelleted clay. Relief of lakes and channels to 8m, lunettes to 15m.

Scattered black box *(Eucalyptus largiflorens*), river red gum *(Eucalyptus camaldulensis*), nitre goosefoot (*Chenopodium nitrariaceum*), lignum (*Muehlenbeckia cunninghamii*), yanga bush (*Maireana brevifolia*) and old man saltbush (*Atriplex nummularia*) on lakebeds. Shallower swamps with cumbungi (*Typha orientalis*), common reed (*Phragmites australis*), bushy groundsel (*Senecio cunninghamii*), spike rush (*Eleocharis* sp.) and water couch (*Paspalum paspalodes*). Numerous aquatic plants in standing water. Lunettes and sand hills with marginal bimble box *(Eucalyptus populnea*), white cypress pine (*Callitris glaucophylla*), yanga bush, bluebush (*Maireana* sp.) and grasses.

Mbd Murrumbidgee Scalded Plains RIV Murrumbidgee
Quaternary alluvial plains with extensive scalding interpreted as relic floodplains or terraces. Grey, brown and red cracking clays, red brown texture-contrast soils with scalds. Levees traces evident, relief generally <1m, up to 5m on associated pans, swamps and lunettes.

Low shrublands and grasslands of bladder saltbush (*Atriplex vesicaria*), other annual saltbushes (*Atriplex* sp.), numerous burrs (*Sclerolaena* sp.), cottonbush (*Maireana aphylla*), bush minuria (*Minuria cunninghamii*), white-top grass (*Austrodanthonia caespitosa*), windmill grass (*Chloris truncata*), and hill wallaby grass (*Austrodanthonia eriantha*).

Mrd Murrumbidgee Source-bordering Dunes RIV Murrumbidgee
Sandy rises adjacent to river channels and along prior streambeds, deep red and brown sands and loams, relief 3 to 12m. Often heavily grazed and subject to wind erosion.

White cypress pine (*Callitris glaucophylla*), needlewood (*Hakea leucoptera*), hooked needlewood (*Hakea tephrosperma*), wilga (*Geijera parviflora*), bull oak (*Allocasuarina luehmannii*), emu bush (*Eremophila longifolia*), miljee (*Acacia oswaldii*), yarran (*Acacia homalophylla*), native quince (*Petalostigma pubescens*), thorny saltbush (*Rhagodia*

sp*inescens*), western pittosporum (*Pittosporum phylliraeoides*), belah (*Casuarina cristata*), some bimble box *(Eucalyptus populnea*), narrow-leaf hopbush (*Dodonaea attenuata*) with sparse grasses. Black bluebush (*Maireana pyramidata*) occurs in the shrub layer in western areas.

SB - Descriptions for Landscapes in the Sydney Basin Bioregion

Meso: SB Burragorang

Bvg Burragorang Valley and Gorges SB Burragorang

Deep steep sided benched slopes and gorge of the Wollondilly and Coxs Rivers incised into mostly horizontal Triassic quartz sandstone conglomerate, siltstone, and shale, cliffs to 150m high with waterfalls, general elevation 50 to 220, local relief 150m. The gorge widens upstream and exposes underlying Permian chest, mudstones and conglomerate. Very extensive rock outcrop, thin yellow to yellow-brown silty sand and gravel with occasional white clay layers forming either shallow yellow earths or gleyed texture-contrast profiles. Red bloodwood (*Corymbia gummifera*), turpentine (*Syncarpia glomulifera*), and rainforest elements at the base of the gorge in sandstone. Steep debris slopes below cliff upstream with forest red gum *(Eucalyptus tereticornis*), red stringybark *(Eucalyptus macrorhyncha*), narrow-leaved ironbark *(Eucalyptus crebra*), and brittle gum *(Eucalyptus mannifera*). Moist protected environments with Sydney blue gum *(Eucalyptus saligna*), mountain grey gum, *(Eucalyptus cypellocarpa*) yellow stringybark *(Eucalyptus muelleriana*) and gully gum *(Eucalyptus smithii*). Gallery forest of river oak (*Casuarina cunninghamiana*) with round-leaved gum *(Eucalyptus deanii*) and Camden white gum *(Eucalyptus benthamii*) along the main streams.

Nat Nattai Plateau SB Burragorang

Steeply dissected plateau remnants on lower Triassic lithic sandstone, shale and tuff, abundant rock outcrop and cliffs, steep debris slopes, general elevation 600 to 700m, local relief 80m. Shallow sand and occasional yellow texture-contrast soils. Forests of thin-leaved stringybark *(Eucalyptus eugenioides*), broad-leaved ironbark *(Eucalyptus fibrosa* ssp. *fibrosa*), Port Jackson pine (*Callitris rhomboidea*), silvertop ash *(Eucalyptus sieberi*), Blaxland's stringybark *(Eucalyptus blaxlandii*), brown barrel *(Eucalyptus fastigata*) and manna gum *(Eucalyptus viminalis*).

Smr Scotts Main Range SB Burragorang

Linear ranges with small sandstone caps, string structural control of drainage by folded Devonian basement, prominent cliff lines in Triassic units with joint control. Triassic lithic sandstone, conglomerate and siltstone over Permian conglomerates and lithic sandstones unconformably on upper Devonian quartzose sandstone and shale. General elevation 400 to 850m, local relief 250m with a few peaks to 1000m. Shallow sand and occasional yellow texture-contrast soils. Woodland of; narrow-leaved ironbark *(Eucalyptus crebra*), grey gum *(Eucalyptus punctata*), thin-leaved stringybark *(Eucalyptus eugenioides*), scribbly gum *(Eucalyptus sclerophylla*), and narrow-leaved apple (*Angophora bakeri*).

Sil Silverdale Slopes SB Burragorang

Moderately undulating slopes descending to the east on gently dipping Triassic shales and sandstones. General elevation 230 to 630m, local relief 200m. Brown to yellow-brown texture-contrast soils. Woodland to forest with a shrubby understorey, common species; grey gum *(Eucalyptus punctata*), white box *(Eucalyptus albens*), grey ironbark *(Eucalyptus paniculata*), narrow-leaved ironbark *(Eucalyptus crebra*), broad-leaved ironbark *(Eucalyptus*

fibrosa ssp. *fibrosa*), grey box *(Eucalyptus moluccana*), forest oak (*Allocasuarina torulosa*), thin-leaved stringybark *(Eucalyptus eugenioides*) and occasional turpentine (*Syncarpia glomulifera*).

Meso: SB Capertee

Cpt Capertee Plateau SB Capertee

Wide valleys, low rolling hills below sandstone cliffs on Permian conglomerates, sandstones, and shales with coal at the base of the Sydney Basin and exposure of underlying Devonian shale, siltstone or quartzite. Small areas of Tertiary basalt. General elevation 800 to 1000m, local relief 100-120m. Isolated flat top mountains in the valleys formed as pinnacles or remnant pieces of plateau. Shoulder slopes with stone pillars or 'pagodas' above steep canyons on tributary streams falling into gorges. Low gradient swampy streamlines. Shallow stony texture-contrast profiles, usually with gritty well drained A-horizons, over tough yellow or grey poorly drained clays. Bouldery debris with clay matrix below cliffs (talus). Organic sand in swamps. Red brown structured loams on basalt. Woodlands of; rough-barked apple (*Angophora floribunda*), red stringybark (*Euscalyptus macrorhyncha*), red box *(Eucalyptus polyanthemos*), yellow box *(Eucalyptus melliodora*), Blakely's red gum *(Eucalyptus blakelyi*) with shrubby understorey and wallaby grass (*Austrodanthonia* sp.) in open valleys. Scribbly gum *(Eucalyptus sclerophylla*), red stringybark *(Eucalyptus macrorhyncha*), red box and broad-leaved ironbark *(Eucalyptus fibrosa* ssp. *fibrosa*) on talus slopes. Silvertop ash *(Eucalyptus sieberi*) and Sydney peppermint *(Eucalyptus piperita*) on sandstone peaks. Dwarf casuarina (*Allocasuarina nana*), tea-tree (*Leptospermum* sp.), and sedge on pagoda margins.

Csl Capertee Slopes SB Capertee

Steep debris slopes below the Cherry Tree Plateau landscape in Permian lithic sandstones, conglomerate, shale and coal measures extending to the valley floors where steep dipping Devonian quartz sandstone, slate and tuff is exposed. General elevation 500 to 800m, local relief 100m. Stony yellow and grey texture-contrast soils. Debris slopes woodland and open forest of; scribbly gum (*Eucalyptus rossii*), red stringybark *(Eucalyptus macrorhyncha*), red box *(Eucalyptus polyanthemos*), narrow-leaved ironbark *(Eucalyptus crebra*), with mountain grey gum *(Eucalyptus cypellocarpa*), thin-leaved stringybark *(Eucalyptus eugenioides*), and yellow box *(Eucalyptus melliodora*) in sheltered sites. Lower slopes woodland with; yellow box, Blakely's red gum *(Eucalyptus blakelyi*), white box *(Eucalyptus albens*) and narrow-leaved ironbark.

Crl Cherry Tree Plateau SB Capertee

Flat topped plateau remnants of Tertiary basalt caps over horizontal Triassic quartz sandstone and shale. General elevation 800 to 1000m, local relief 150m. Red, well-structured, fertile clay loams and light clay on basalt, gradational brown loams below the basalt. Tall forest of manna gum *(Eucalyptus viminalis*) and Blaxland's stringybark *(Eucalyptus blaxlandii*) with ferns.

Meso: SB Cataract

Dfs Darkes Forest Sands SB Cataract

Upland swamps on Quaternary slope mantles and sand accumulations at the heads of streams on the Woronora Plateau, general elevation 350 to 400m, local relief <20m. Individual swamps are widely distributed and isolated in each catchment. Saturated humic clayey sands over weathered sandstone up to 3m deep. Well-drained red and yellow earth with ironstone concretions on adjacent ridges. Scribbly gum *(Eucalyptus rossii*), narrow-leaved stringybark *(Eucalyptus sparsifolia*) and dwarf red bloodwood (*Corymbia gummifera*) on swamp margins. Sedge heath complex with *Banksia oblongifolia*, *Hakea teretifolia*, *Cryptandra ericoides*, *Grevillea parviflora* and mat-rush (*Lomandra* sp.), small grass trees and numerous sedge species. Thickets of heath banksia (*Banksia ericifolia*), dagger hakea (*Hakea teretifolia*), and

tea-tree (*Leptospermum* sp.) thickets with swamp banksia (*Banksia robur*) along drainage lines. Silvertop ash *(Eucalyptus sieberi*), red bloodwood (*Corymbia gummifera*) and snappy gum *(Eucalyptus racemosa*) on the earths.

Ung Upper Nepean Gorges SB Cataract

Steep sided benched slopes of the Nepean River tributaries on Triassic quartz sandstones, general elevation 250 to 350m, local relief 80m. Shallow well-drained sands with limited development of yellow texture-contrast soils on benches underlain by clayey sandstone of thin shale units. Gully forests of grey gum *(Eucalyptus punctata*), blackbutt *(Eucalyptus pilularis*), smooth-barked apple (*Angophora costata*), red bloodwood (*Corymbia gummifera*), silvertop ash *(Eucalyptus sieberi*), and blue-leaved stringybark *(Eucalyptus agglomerata*). Shrubby understorey with native cherry (*Exocarpus cupressiformis*), woolly pomaderris (*Pomaderris lanigera*), hairpin banksia (*Banksia* sp*inulosa*), cone sticks (*Petrophile* sp.), and narrow-leaved geebung (*Persoonia linearis*).

Wpp Woronora Plateau SB Cataract

Extensive plateau developed on Triassic quartz sandstone with benched low angle slopes and a marked break to steep sided deep valleys controlled by joint patterns. General elevation 400 to 500m, local relief 100m. Small areas of nodular ironstone on ridge crests, deep uniform sands or texture-contrast soils on slopes and deep uniform grey or white organic sands on swampy valley floors. Rock outcrop common on ridgelines and in creeks, absent from most slopes. Woodlands with shrubby understorey of silvertop ash *(Eucalyptus sieberi*), Sydney peppermint (*Eucalyptus piperita*), old man banksia (*Banksia serrata*), smooth-barked apple (*Angophora costata*), on ridges. Shrublands of heath banksia (*Banksia ericifolia*), hairpin banksia (*Banksia* sp*inulosa*), dagger hakea (*Hakea teretifolia*), she-oak (*Allocasuarina* sp.) and soft geebung (*Persoonia mollis*) with *Gahnia* sp., on slopes and extensive hanging swamps in saturated organic sands on the lowest slopes and valley floors with heath of; *Hakea* sp., swamp banksia (*Banksia robur*), button grass (*Gymnoschoenus sphaerocephalus*) and grass trees (*Xanthorrhoea* sp.). Contour parallel patterned ground of ridges and trenches is common.

Meso: SB Coastal Barriers

Bhb Bherwerre Barrier SB Coastal Barriers

Beach, dune and intermittently closed and open lagoon complexes of the South Coast. Quaternary quartz sand in dunes with muddy sands in the lagoons, general elevation 0 to 15m, local relief 5 to 10m. Coastal barriers extend from clean dune sands to deep podsols in Pleistocene dunes. Sand dunes have barrier sequence of coast tea-tree (*Leptospermum laevigatum*), coast banksias (*Banksia integrifolia*), coast wattles (*Acacia longifolia* ssp. *sophorae*) merging to protected forests and scrubs with smooth-barked apple (*Angophora costata*), red bloodwood (*Corymbia gummifera*), forest oak (*Allocasuarina torulosa*), southern mahogany *(Eucalyptus botryoides*) and blackbutt *(Eucalyptus pilularis*). Swamp oak (*Casuarina glauca*), salt marsh and mangrove sequence in estuaries, common reed (*Phragmites australis*) and *Juncus* sp., in fresher waters.

Lab Lake Illawarra Barrier SB Coastal Barriers

This landscape is substantially altered by urban and industrial development but would originally have a very similar structure and composition to the Seven Mile Barrier Landscape. General elevation 0 to 25m, local relief 5m. Eel grass (*Zostera capricorni*) on the lake floor, common reed (*Phragmites australis*) in fresh swamps and lakes margins, limited grey mangrove (*Avicennia marina*) and saltmarsh near lagoon mouths and in more open estuaries.

Slb Seven Mile Barrier SB Coastal Barriers

Quaternary coastal barrier system. A series of quartz sand dunes formed into parallel multiple beach-ridges north of the mouth of the Shoalhaven River. General elevation 0 to 25m, local

relief 8m. Ridges increase in ages, degree of soil development and vegetation composition from the beach inland. Adjacent to the beach face coastal spinifex (*Spinifex hirsutus*), coast tea-tree (*Leptospermum laevigatum*), and coast wattle (*Acacia longifolia* ssp. *sophorae*) dominate a high, steep dune with little soil development. Across the lower, inner ridges a tall forest of blackbutt *(Eucalyptus pilularis*), southern mahogany *(Eucalyptus botryoides*), red bloodwood (*Corymbia gummifera*), old man banksia (*Banksia serrata*) smooth-barked apple (*Angophora costata*) with occasional macrozamia (*Macrozamia* sp.) and thick bracken (*Pteridium esculentum*) cover on soils with characteristic podsol profiles that increase in degree of development inland. The innermost ridge lies adjacent to extensive swamps and wetlands formed on organic rich quartz sands.

Snb Sydney - Newcastle Barriers and Beaches SB Coastal Barriers

Quaternary coastal sediments on long recurved quartz sand beaches between rocky headlands backed by sand dunes and intermittently closed and open lagoons. Includes areas of more extensive high dunes often located on top of the headlands. General elevation 0 to 30m, local relief 10m. Cliff top dunes may be found as high as 90m above sea level. Distinct zonation of vegetation and increasing soil development from the beach to the inland dunes. At the beach; spinifex (*Spinifex hirsutus*), spiky mat-rush (*Lomandra longifolia*), coast wattle (*Acacia longifolia* ssp. *sophorae*) and coast tea-tree (*Leptospermum laevigatum*) colonise the frontal dune in which there is little soil development. Coast banksia (*Banksia integrifolia*) and old man banksia (*Banksia serrata*) are found on the second dunes and these merge with more complex forest containing blackbutt *(Eucalyptus pilularis*), red bloodwood (*Corymbia gummifera*), grass trees (*Xanthorrhoea* sp.) and numerous understorey shrubs on deep sands that have an organic rich A horizon, a bleached A2 horizon and the initial development of weak iron or organic pans in the sandy subsoil. Well-developed, deep podsol profiles are present in cliff top dunes with swampy swales indicating that these forms are probably older than the coastal dunes. Vegetation of *Banksia aemula* heathland and open scrub of coast banksia (*Banksia integrifolia*), coast rosemary (*Westringea fruticosa*), coast tea-tree and grass tree, with dwarfed smooth-barked apple (*Angophora costata*) and red bloodwood. Freshwater sedge swamps in larger areas of sand. In the lagoons salinity varies depending on tidal flushing and they are often surrounded by broad-leaved tea-tree (*Melaleuca quinquenervia*) and swamp oak (*Casuarina glauca*). Water margins are occupied by *Juncus* sp. and common reed (*Phragmites australis*) in fresh water areas. Grey mangrove (*Avicennia marina*) may occur in some tidal inlets.

Meso: SB Cumberland

Asp Ashfield Plains SB Cumberland

Undulating hills and valleys on horizontal Triassic shale and siltstone, occasional quartz sandstones especially near the margin of the Port Jackson landscape. General elevation 0 to 45m, local relief <20m. Coastal extension of the Cumberland Plain landscape. Red and brown texture-contrast soils on crests grading to yellow harsh texture-contrast soils in valleys. Open forest of broad-leaved ironbark *(Eucalyptus fibrosa* ssp. *fibrosa*), grey box *(Eucalyptus moluccana*), with tea-tree (*Leptospermum* sp.) along creeks and forests of turpentine (*Syncarpis glomulifera*), red mahogany *(Eucalyptus resinifera*), grey gum *(Eucalyptus punctata*), Sydney blue gum *(Eucalyptus saligna*) and blackbutt *(Eucalyptus pilularis*) with a grassy understorey of kangaroo grass (*Themeda triandra*) on moister sites.

Cpl Cumberland Plain SB Cumberland

Low rolling hills and valleys in a rain shadow area between the Blue Mountains and the coast on horizontal Triassic shales and lithic sandstones forming a down-warped block on the coastal side of the Lapstone monocline. Intruded by a small number of volcanic vents and partly covered by Tertiary river gravels and sands (Hawkesbury-Nepean Terrace Gravels landscape). Quaternary alluvium along the mains streams. General elevation 30 to 120m, local relief 50m. and sometimes affected by salt in tributary valley floors. Pedal uniform red

to brown clays on volcanic hills. Red and brown texture-contrast soils on crests grading to yellow harsh texture-contrast soils in valleys. Woodlands and open forest of grey box *(Eucalyptus moluccana*), forest red gum *(Eucalyptus tereticornis*), narrow-leaved ironbark *(Eucalyptus crebra*), thin-leaved stringybark *(Eucalyptus eugenioides*), cabbage gum *(Eucalyptus amplifolia*) and broad-leaved apple (*Angophora subvelutina*). Grassy to shrubby understorey often dominated by Australian boxthorn (*Bursaria* sp*inosa*), poorly drained valley floors, often salt affected with swamp oak (*Casuarina glauca*) and paperbark (*Melaleuca* sp.).

Gra Georges River Alluvial Plain SB Cumberland

Channel, floodplain and terraces of the Georges River on Quaternary and Tertiary alluvial sediments. Mostly clayey sand and sand with limited gravel on the highest terrace, general elevation 0 to 30m, local relief 10m. Massive uniform or gradational profiles on yellow brown to orange clayey sand. Podsols with well developed double pans on limited areas of deep quartz sand, stony, harsh, yellow, texture-contrast soils on higher terraces. Forest and woodland of cabbage gum *(Eucalyptus amplifolia*), rough-barked apple (*Angophora floribunda*), broad-leaved ironbark *(Eucalyptus fibrosa* ssp. *fibrosa*), scribbly gum *(Eucalyptus sclerophylla*) and narrow-leaved apple (*Angophora bakeri*). Extensive swamp oak (*Casuarina glauca*) along the riverbanks and in low-lying areas often with prickly-leaved tea-tree (*Leptosp*e*rmum styphelioides*), these extend to brackish estuarine swamps with grey mangrove (*Avicennia marina*) and limited saltmarsh.

Hac Hawkesbury - Nepean Channels and Floodplains SB Cumberland

Meandering channel and moderately wide floodplain of the Hawkesbury and Nepean rivers on Quaternary sand and gravel. Sand is dominant upstream of the Warragamba River junction, general elevation 0 to 20m, local relief <10m. Undifferentiated alluvial sand to poorly structured gradation profiles of sandy loam or clay loam. Forests on the river flats include blue box *(Eucalyptus baueriana*), broad-leaved apple (*Angophora subvelutina*), manna gum *(Eucalyptus viminalis*), river peppermint *(Eucalyptus elata*) in upstream sectors and dominated by river oak (*Casuarina cunninghamiana*) possibly originally with rainforest species such as white cedar (*Melia azedarach*) in the lower sectors. Common reed (*Phragmites australis*), cumbungi (*Typha orientalis*) and other aquatic plants are found in the river. Deep organic loams and loamy sands on floodplain with river flat forest of Sydney blue gum *(Eucalyptus saligna*), round-leaved gum *(Eucalyptus deanei*), forest red gum *(Eucalyptus tereticornis*), cabbage gum *(Eucalyptus amplifolia*), broad-leaved apple, rough-barked apple (*Angophora floribunda*) and river oak. Water gum (*Tristaniopsis laurina*) in protected channel sections. Large swamps and lagoons on the floodplain and in tributary streams below Richmond dammed by levees on the main stream support tall spike rush (*Eleocharis* sp*hacelata*), *Juncus* sp., *Melaleuca* sp., and *Lepidosperma* sp. Below Pitt Town the river is tidal and swamp oak (*Casuarina glauca*), common reed, river mangrove (*Aegiceras corniculatum*), grey mangrove (*Avicennia marina*) and limited salt marsh are found on the muddy sands of the inter-tidal zone.

Htg Hawkesbury - Nepean Terrace Gravels SB Cumberland

Three levels of river terrace dating into the Tertiary. General elevation 20 to 45m, local relief 10m. Planar, poorly drained terraces with harsh texture-contrast soils and heavy clays in swamps and cut-off meanders. In places deep sands of crevasse splays support scribbly gum *(Eucalyptus sclerophylla*), narrow-leaved apple (*Angophora bakeri*) and old man banksia (*Banksia serrata*) on podsols with adjacent sedgelands. Most clay-based soils (harsh texture-contrast profiles) are very gravelly and carry broad-leaved ironbark *(Eucalyptus fibrosa* ssp.*fibrosa*) and narrow-leaved ironbark *(Eucalyptus crebra*), grey box *(Eucalyptus moluccana*), paperbarks (*Melaleuca* sp.) and drooping red gum *(Eucalyptus parramattensis*). Several vegetation communities are now rare especially that on the Pliocene/Pleistocene sand body with podsol soil profiles at Agnes Banks.

Pbh Picton - Razorback Hills SB Cumberland

Plateau ridge with steep slopes on horizontal upper Triassic shale, carbonaceous claystone, and lithic sandstone, subject to extensive earthflows on slopes above 120, general elevation 180 to 300m, local relief 90m. Harsh, red, brown or yellow texture-contrast soils with reactive clay subsoils. Open forest of Sydney blue gum *(Eucalyptus saligna*), blackbutt *(Eucalyptus pilularis*), grey box *(Eucalyptus moluccana*), forest red gum *(Eucalyptus tereticornis*), white stringybark *(Eucalyptus globoidea*) with Australian boxthorn (*Bursaria* sp*inosa*) and kangaroo grass (*Themeda triandra*) on lower slopes. Endangered community of dry vine forest in gullies and under lithic sandstone escarpments; red ash (*Alphitonia excelsa*), red cedar (*Toona australis*), guioa (*Guioa semiglauca*), Port Jackson fig (*Ficus rubiginosa*), prickly paperbark (*Melaleuca styphelioides*), mock olive (*Notelaea longifolia*), yellow pittosporum (*Pittosporum revolutum*), gum vine (*Marsdenia rostrata*), wonga vine (*Pandorea pandorana*), water vine (*Cissus antarctica*) and slender grape (*Cayratia clematidea*).

Meso: SB Escarpment

Swe Sydney Basin Western Escarpment SB Escarpment

Steep dissected slopes on the western margin of the Triassic rocks and descending into the Permian conglomerate, shale and sandstone. Cliffs and gorges to 100m, general elevation 250 to 1000m, local relief 150m. Brown loamy sands in rubbly soil on debris slopes, with deeper accumulations toward the valley floor. Dry aspects; open forest of Sydney peppermint *(Eucalyptus piperita*), smooth-barked apple (*Angophora costata*), grey gum *(Eucalyptus punctata*), broad-leaved ironbark *(Eucalyptus fibrosa* ssp. *fibrosa*) and rough-barked apple (*Angophora floribunda*). Moist aspects; tall open forest of round-leaved gum *(Eucalyptus deanei*), turpentine (*Syncarpia glomulifera*), Sydney blue gum *(Eucalyptus saligna*), blue-leaved stringybark *(Eucalyptus agglomerata*), thin-leaved stringybark *(Eucalyptus eugenioides*) and narrow-leaved ironbark *(Eucalyptus crebra*). Coachwood (*Ceratopetalum apetalum*) and sassafras (*Doryphora sassafras*) in the gullies.

Meso: SB Ettrema

Ytl Yalwal - Tallowal Tableland SB Ettrema

Plateau, with gentle stepped slopes bounded by deep cliffed gorges on horizontally bedded Permian quartz sandstones and conglomerate of the Shoalhaven group. Altitude about 700m above sea level and local relief on the plateau of 100-120m. Benches typically 50-100m wide with shallow sands over bedrock or deeper organic sands. Very distinctive contour banded vegetation patterns and joint control of drainage evident on air photos. Vegetation complex of woodlands with silvertop ash *(Eucalyptus sieberi*) and brittle gum *(Eucalyptus mannifera*) on deeper soils over joint crevices, closed mallee scrub of *Eucalyptus dendromorpha* on higher ridges and terraces, dwarf shrubland of she-oak (*Casuarina or Allocasurina*) or common fringe myrtle (*Calytrix tetragona*), and wet sedgeland of *Lepyrodia* sp., on thinner wetter soils in seepage areas.

Ylg Yalwal Gorges SB Ettrema

Steep gorges with cliffs and waterfalls incised through horizontal Permian lithic sandstone, conglomerate and siltstone into Devonian quartz sandstone, conglomerate, siltstone, basalt, rhyolite and tuff, Carboniferous granite and Ordovician slate and chert. General elevation 200 to 450m, local relief 100m. Limited sandy soil on gorge margins, deep accumulations of quartz sand amongst bouldery debris on narrow valley floors. Small areas of texture-contrast soils on Palaeozoic bedrock. Dense gully vegetation with; Sydney peppermint *(Eucalyptus piperita*), turpentine (*Syncarpia glomulifera*), water gum (*Tristaniopsis laurina*), grey myrtle (*Backhousia myrtifolia*), sandpaper fig (*Ficus coronata*) and cabbage-tree palm (*Livistona australis*).

Meso: SB Hornsby

Hpl Hornsby Plateau SB Hornsby

Benched hill slopes and steep hills with narrow flat-topped ridges and broader plateau tops on horizontal Triassic quartz sandstone with occasional conglomerate and thin discontinuous shales. Isolated thicker shales and areas of 'laterite' development on plateaus. General elevation 0 to 220m, local relief 30 to 120m. Shallow uniform sands amongst rock outcrops. Deep gradational yellow earths on some plateau areas, yellow texture-contrast soils on benches, deep uniform sands, organic sands and limited podsols in depositional areas. Very diverse vegetation related to site and soil conditions. Crests and ridges, scribbly gum *(Eucalyptus haemostoma*), red bloodwood (*Corymbia gummifera*), brown stringybark *(Eucalyptus capitellata*), silvertop ash *(Eucalyptus sieberi*) and old man banksia (*Banksia serrata*) with a high proportion of Proteaceae and Acacia in the understorey. Slopes; smooth-barked apple (*Angophora costata*), Sydney peppermint *(Eucalyptus piperita*), yellow bloodwood (*Corymbia eximia*), *Leptospermum* sp., and forest oak (*Allocasuarina torulosa*); protected valley floors with rainforest elements including turpentine (*Syncarpia glomulifera*), Sydney blue gum *(Eucalyptus saligna*), blackbutt *(Eucalyptus pilularis*), water gum (*Tristaniopsis laurina*), coachwood (*Ceratopetalum apetalum*), cabbage-tree palm (*Livistona australis*). Extensive wet and dry heaths on plateau, Sydney blue gum, blackbutt, turpentine tall forest on thicker shale ridge tops with deep gradational red clay loam to clay soil.

Phr Pennant Hills Ridges SB Hornsby

Rolling to moderately steep hills on horizontal Triassic shales and siltstones. General elevation 10 to 90m, local relief 60m. Deep red texture-contrast soils on narrow hillcrests, red and brown to yellow texture-contrast soils on slopes becoming slightly harsher in drainage lines. Tall open forest of Sydney blue gum *(Eucalyptus saligna*), turpentine (*Syncarpia glomulifera*), blackbutt *(Eucalyptus pilularis*), white stringybark *(Eucalyptus globoidea*), grey ironbark *(Eucalyptus paniculata*), forest oak (*Allocasuarina torulosa*) and rough-barked apple (*Angophora floribunda*). Rainforest elements in protected moist gully heads with sweet pittosporum (*Pittosporum undulatum*), cheese tree (*Glochidion ferdinandi*), sandpaper fig (*Ficus coronata*) and black wattle (*Callicoma serratifolia*).

Meso: SB Hunter

Chv Central Hunter Alluvial Plains SB Hunter

Channel, floodplain and terraces Hunter River on Quaternary alluvium, general elevation 20 to 40m, local relief 15m. Harsh brown texture-contrast soils on the third terrace, gradational sandy loam on the second terrace and loamy sand on the low terrace and floodplain. Limited areas of source bordering sand dune with grey to yellow-brown sand. Open grassland with scattered yellow box *(Eucalyptus melliodora*), forest red gum *(Eucalyptus tereticornis*), rough-barked apple (*Angophora floribunda*) patches of swamp oak (*Casuarina glauca*) on brackish and saline flats, river oak (*Casuarina cunninghamiana*) along the streams.

Chf Central Hunter Foothills SB Hunter

Undulating lowlands, rounded to steep hills with rock outcrop on ridges on Permian lithic sandstone, conglomerate, shale and coal, general elevation 40 to 300m with a few higher peaks, local relief 30 to 120m. Red-brown to yellow brown harsh texture-contrast soils on slopes, dark coloured clays in valleys and limited accumulations of sand and gravel in streams. Woodlands to open forest of spotted gum *(Corymbia maculata*), forest red gum *(Eucalyptus tereticornis*), narrow-leaved ironbark *(Eucalyptus crebra*), red ironbark *(Eucalyptus sideroxylon*), white box *(Eucalyptus albens*), slaty gum *(Eucalyptus dawsonii*), rough-barked apple (*Angophora floribunda*) with kangaroo grass (*Themeda triandra*) and wallaby grass (*Austrodanthonia* sp).

Het Lower Hunter Channels and Floodplains SB Hunter

Channel, floodplain, and estuarine swamps on Quaternary alluvial estuarine sediments of the Hunter River estuary tract, general elevation 0 to 30m, local relief <10m. Harsh brown texture-contrast soils on the third terrace, gradational sandy loam on the second terrace and loamy sand on the low terrace and floodplain. Acid peaty silty sand, silt and clay in swamps, uniform quartz sand with podsol development on marginal coastal dunes and sand sheets. Open grassland with scattered yellow box *(Eucalyptus melliodora*), forest red gum *(Eucalyptus tereticornis*), rough-barked apple (*Angophora floribunda*) on higher fluvial landscapes. Freshwater and brackish swamps with open water, aquatic plants and fringe woodlands of broad-leaved paperbark (*Melaleuca quinquenervia*), swamp mahogany *(Eucalyptus robusta*), river oak (*Casuarina cunninghamiana*), swamp oak (*Casuarina glauca*), common reed (*Phragmites australis*), river mangrove (*Aegiceras corniculatum*), grey mangrove (*Avicennia marina*) and extensive saltmarsh in tidal areas.

Nrm Newcastle Coastal Ramp SB Hunter

Undulating lowlands and low to steep hills on complex patterns of faulted and gently folded Carboniferous conglomerate, lithic sandstone, felspathic sandstone, and mudstone, general elevation 50 to 275m, local relief 40 to 150m. Stony red texture-contrast soils on steep slopes, yellow and brown texture-contrast soils on lower slopes and deep dark clay loams along streams. Woodland of spotted gum *(Corymbia maculata*), forest red gum *(Eucalyptus tereticornis*), red ironbark *(Eucalyptus sideroxylon*), white mahogany *(Eucalyptus acmenoides*), large-fruited grey gum *(Eucalyptus canaliculata*), with sub-tropical rainforest elements in sheltered gullies. Similar eucalypts with forest oak (*Allocasuarina torulosa*) and grasses on lower slopes, merging to forest of smooth-barked apple (*Angophora costata*), red bloodwood (*Corymbia gummifera*), blackbutt *(Eucalyptus pilularis*) with bracken (*Pteridium esculentum*) and grasses nearer the coast.

Uhc Upper Hunter Channels and Floodplain SB Hunter

Channel, floodplain and terraces of the Hunter River and its tributaries upstream of Denman on Quaternary alluvium, general elevation 100 to 200m, local relief 25m. Harsh yellow brown texture-contrast soils on the third terrace, gradational sandy loam on the second terrace and loamy sand on the low terrace and floodplain. Limited areas of Tertiary river gravels on bedrock spurs. Open grassland with white box *(Eucalyptus albens*), yellow box *(Eucalyptus melliodora*), Blakely's red gum *(Eucalyptus blakelyi*), rough-barked apple (*Angophora floribunda*) and patches of swamp oak (*Casuarina glauca*) on brackish and saline flats, river oak (*Casuarina cunninghamiana*) along the streams.

Meso: SB Illawarra

Bpp Bomaderry Plains SB Illawarra

Quaternary silt and mud on the back plains of the Shoalhaven floodplain, relief <10m. Organic uniform loam and silt loam is widespread Limited dark texture-contrast soils on levees and terrace remnants. Swamps with dense clay were originally common, now drained and cleared. Decorative paperbark (*Melaleuca* sp.), swamp oak (*Casuarina glauca*), forest red gum *(Eucalyptus tereticornis*), Sydney peppermint *(Eucalyptus piperita*). Remnant Illawarra flame tree (*Brachychiton acerifolius*), cabbage-tree palm (*Livistona australis*) and Port Jackson fig (*Ficus rubiginosa*) mark the location of original coastal brush patches.

Bce Bulli Coastal Escarpment SB Illawarra

Cliffed escarpment and rubble slopes of Triassic horizontally bedded massive quartz sandstone, conglomerate, and shale with some areas of layered basalt. Maximum elevation 490m, relief up to 300m with cliff and waterfalls typically 30 to 60m and rarely exceeding 80m. Episodic cliff retreat through extensive rockfalls contributes to the debris slopes. Rainfall on the escarpment is significantly higher than on the coastal slopes and averages about 2200mm. Soils vary from shallow sandy loam on sandstone, texture-contrast profiles on shale and debris slopes, to higher nutrient loam on volcanics and in gully lines where organic

matter transfers nutrients. The high rainfall and elevation encourage mesophilic vegetation on richer soils with cool temperate rainforest elements such as, sassafras (*Doryphora sassafras*), coachwood (*Ceratopetlaum apetalum*), cabbage-tree palm (*Livistona australis*), native tamarind (*Diploglottis australis*), cheese tree (*Glochidion ferdinandi*), lilly pilly (*Acmena smithii*), Illawarra flame tree (*Brachychiton acerifolius*), with water gum (*Tristaniopsis laurina*) and soft tree-ferns (*Dicksonia antarctica*) and rough tree-ferns (*Cyathea australis*) in the gullies. Sydney peppermint *(Eucalyptus piperita*), turpentine (*Syncarpia glomulifera*), grey gum *(Eucalyptus punctata*), smooth-barked apple (*Angophora costata*) and Christmas bush (*Ceratopetalum gummiferum*) dominate more exposed ridgelines.

Dap Dapto - Wollongong Coastal Slopes SB Illawarra

Hilly forestland lying between the steep rubble slopes of the escarpment and valley floors or coastal barriers. A narrow landscape lying between the coast and the escarpment. Formed on Permian sandstone and shale with areas of interbedded basalt. Slopes range from 3 to 27^0 with thin stony soils on crests and upper slopes. Deeper well-structured red and red brown loam and clay loam with some areas of mellow texture-contrast soils of high fertility high and good water holding capacity on mid and lower slopes. Yellow solodic soils with bleached A_2 horizons common on the lowest slopes and stream terraces. Open forest dominated by forest red gum *(Eucalyptus tereticornis*), yellow stringybark *(Eucalyptus muelleriana*), gully gum *(Eucalyptus smithii*), stringybark with rainforest elements along streamlines. Extensively cleared, former areas of coastal brush may be indicated by remnant cabbage-tree palms (*Livistona australis*) and Port Jackson figs (*Ficus rubiginosa*).

Kav Kangaroo Valley SB Illawarra

An enclosed, narrow, western facing valley surrounded by sandstone escarpment features comparable to the Bulli coastal escapement. The valley is incised into Permian pebbly siltstone and sandstone. Relief 180m with the valley floor at 80 to 100m above sea level. Soils on the slopes are loamy sand matrix in a sandstone rubble beneath cliff lines, then yellow texture-contrast profiles grading to deep loam on the valley floors. Tall forests below the escarpment of; yellow stringybark *(Eucalyptus muelleriana*), Sydney peppermint *(Eucalyptus piperita*), silvertop ash *(Eucalyptus sieberi*), turpentine (*Syncarpia glomulifera*), two-veined hickory (*Acacia binervata*), narrow-leaved geebung (*Persoonia linerais*), and sandfly zieria (*Zieria smithii*). On the lower texture-contrast soils; narrow-leaved peppermint *(Eucalyptus radiata*), brown barrel *(Eucalyptus fastigata*), yellow stringybark, river peppermint *(Eucalyptus elata*), forest oak (*Allocasuarina torulosa*), prickly oxylobium (*Oxylobium ilicifolium*), and hop goodenia (*Goodenia ovata*). Open forest on the foothills of; forest oak, forest red gum *(Eucalyptus tereticornis*), rough-barked apple (*Angophora floribunda*), southern mahogany *(Eucalyptus botryoides*), river peppermint, *Breynia* sp., with water gum (*Tristainiopsis laurina*) and patches of coachwood (*Ceratopetalum apetalum*) and red cedar (*Toona australis*) along the stream margins.

Kip Kiama Coastal Slopes SB Illawarra

Comparable to the Dapto-Wollongong slopes but with higher relief, steep slopes and higher rainfall. Maximum elevation 250m, relief 160m. Well-structured red-brown loam with gradational profiles is widespread on the Gerringong volcanics of trachyte, latite and tuff. Sandstone is less common but tends to form steep slopes with texture-contrast soils marginal to the adjacent escarpment. Extensively cleared but originally had a wide distribution of rainforest elements; cabbage palm (*Livistona australis*), scentless rosewood (*Synoum glandulosum*), brush cherry (*Syzygium australe*), black apple (*Planchonella australis*), plum pine (*Podocarpus elatus*) amongst turpentine (*Syncarpia glomulifera*) and grey ironbark *(Eucalyptus paniculata*). River oak (*Casuarina cunninghamiana*) along the streams.

Lap Lake Illawarra Alluvial Plains SB Illawarra

Quaternary sand, silt and clay of the floodplain and alluvial fans of streams entering Lake Illawarra, general elevation 0 to 40m, local relief <10m. Soils differ with sediment type but

are generally uniform sandy loam with high organic content, and humic podsols on some older dunes. Most of the plains are cleared but originally had forest red gum *(Eucalyptus tereticornis*), woollybutt *(Eucalyptus longifolia*), white stringybark *(Eucalyptus globoidea*), thin-leaved stringybark *(Eucalyptus eugenioides*), cabbage gum *(Eucalyptus amplifolia*) and extensive stands of swamp oak (*Casuarina glauca*), prickly paperbark (*Melaleuca styphelioides*) and decorative paperbark (*Melaleuca* sp.) on brackish wet ground near creeks. River oak (*Casuarina cunninhammiana*) on fresh water streams.

Sha Shoalhaven Channels and Floodplains SB Illawarra

Channels and floodplains of Eastern Alluvial deposits over basic and acid volcanics and associated sediments. Yellow and red contrast texture soils, and massive red and yellow earths. Some shallow loams. Elevation 600m to 735m, local relief to 3m. Largely cleared, with some areas of Tableland Swamp Flats (*Eucalyptus viminalis*, *E. pauciflora*, with *Rubus parviflorus* dominated shrubby understorey, or grasses - *Microlaena stipoides*, *Duchondra* spp.), Tablelands Flats Grasslands (*Poa* spp., *Carex* spp., *Juncus* spp., *Themeda australis*). Small areas of Frost Hollow Grassy Woodland (*E. pauciflora*, *E. rubida* with grassy understorey including *Themeda australis*, *Gonocarpus tetrgynus*, *Microlaena stipoides*.

Shc Shoalhaven Alluvial Plain SB Illawarra

Quaternary sands and gravels of the floodplain and terraces of the Shoalhaven River below the point where the river leaves its mountain and gorge tract to form a confined alluvial fan near the coast. Soils differ with sediment type but are generally uniform sandy loam with high organic content. General elevation 0 to 30m, local relief <10m. Minor geomorphic features of meander scroll plains, islands, cut-off meanders and associated swamps are common. River peppermint *(Eucalyptus elata*) and river oak (*Casuarina cunninghamiana*) common in the upper reaches merging downstream to brackish and saline riparian communities of swamp oak (*Casuarina glauca*), river mangrove (*Aegiceras corniculatum*) and common reed (*Phragmites australis*), to grey mangrove (*Avicennia marina*) and salt marsh.

Meso: SB Jervis

Kih Kioloa Headland SB Jervis

Coastal headland and local peak on Cretaceous micro-gabbro intrusion, general elevation 0 to 110m, local relief 110m. Uniform soil profile of stony dark brown and grey clay with a thick organic layer and impeded drainage. Spotted gum *(Corymbia maculata*), blackbutt *(Eucalyptus pilularis*), southern mahogany *(Eucalyptus botryoides*), sassafras (*Doryphora sassafras*), cheese tree (*Glochidion ferdinandi*), sandpaper fig (*Ficus coronata*), lilly pilly (*Acmena smithii*), black wattle (*Callicoma* sp.), water gum (*Tristaniopsis laurina*), tree-ferns (*Cyathea* sp.), cabbage-tree palm (*Livistona australis*), with an understorey of common saw sedge (*Gahnia* sp.), bracken (*Pteridium esculentum*) and rainbow fern (*Calochlaenia dubia*).

Mih Milton Hills SB Jervis

Low undulating basin and surrounding steep contact ridge on Cretaceous microsyenite and trachyte intrusion into Permian lithic sandstone, general elevation 50 to 150m, local relief 80m. Uniform and gradational soil profiles of fertile brown gritty loam and clay loam. Open forest of coastal grey box *(Eucalyptus moluccana*), forest red gum *(Eucalyptus tereticornis*), thin-leaved stringybark *(Eucalyptus eugenioides*) and black wattle (*Callicoma serratifolia*) with grasses and sedges. Gullies, deeper soils and protected environments under the escarpment with dry rainforest including; turpentine (*Syncarpia glomulifera*), red cedar (*Toona australis*), whalebone tree (*Streblus brunonianus*), red-fruited olive plum (*Cassine australe*), red ash (*Alphitonia excelsa*), giant stinging tree (*Dendrocnide excelsa*), Port Jackson fig (*Ficus rubiginosa*), sandpaper fig (*Ficus coronata*), brush cherry (*Syzygium australe*), lilly pilly (*Acmena smithii*), pigeon-berry ash (*Elaeocarpus kirtonii*), water vine

(*Cissus antarctica*), sarsaparilla (*Smilax glaucophylla*), ferns, grasses and saw sedge (*Gahnia* sp.).

Nds Nowra - Durras Coastal Slopes SB Jervis
Comparable to the Dapto-Wollongong slopes but with lower relief, undulating slopes and lower rainfall. Permian lithic sandstone and pebbly siltstone with yellow and yellow-red texture-contrast soils. General elevation 20 to 80m, local relief 30m. Open forest of spotted gum *(Corymbia maculata*) with extensive *Macrozamia* sp., and blady grass (*Imperata cylindrica*) understorey. Freshwater reed (*Phragmites australis*) swamps on wider valley floors, merging down valley with swamp oak (*Casuarina glauca*) communities. This landscape becomes wider to the south and may be difficult to distinguish in the field from the Wandandian Coastal Plains landscape.

Wap Wandandian Coastal Plains SB Jervis
Undulating slopes and wide flat valleys with dendritic drainage on horizontal Permian lithic sandstone and pebbly siltstone, general elevation 20 to 80m, local relief <30m. Yellow and yellow-red deep texture-contrast soils with bleached topsoils and harsh clay subsoil. Open forest of spotted gum *(Corymbia maculata*), forest oak (*Allocasuarina torulosa*) with extensive macrozamia (*Macrozamia* sp.) and blady grass (*Imperata cylindrica*) understorey. Freshwater reed (*Phragmites australis*) swamps on wider valley floors, merging down valley with swamp oak (*Casuarina glauca*) communities especially in brackish water of estuaries where organic sands and mud support grey mangrove (*Avicennia marina*) and limited saltmarsh.

Meso: SB Jervis Basalts

Mcb Milton Basalts and Sands SB Jervis Basalts
Low flat hills near the coast on Tertiary basalts and underlying quartz gravel and sand, elevation 40 to 60m. Well-structured, fertile, brown to red-brown loams and clay loams on basalt with bleached sandy podsols with thin iron pan development on the sands. Red bloodwood (*Corymbia gummifera*), old man banksia (*Banksia serrata*). On the coastal headlands heaths of hakea (*Hakea sericea*), melaleuca (*Melaleuca armillaris*), coast rosemary (*Westringia friticosa*) and dwarfed red bloodwood (*Corymbia gummifera*) occur in shallow soils subject to high salt spray input and frequent fire.

Meso: SB Jervis Granites

Wag Wandandian Granite SB Jervis Granites
Very small areas of Devonian(?) granite, exposed in valleys incised through Permian siltstone and silty sandstone, elevation about 170m. No specific soils or vegetation data available but probably similar to Moruya Granite Basins landscape.

Meso: SB Kerrabee

Grf Goulburn River Channels and Floodplains SB Kerrabee
Channel, floodplain terraces and valley foothills on Quaternary alluvium and colluvium, general elevation 150 to 250m, local relief 30m. Deep gravelly coarse textured red and brown earths on upper slopes, harsh yellow-brown texture-contrast soils on terraces, gradational and uniform sands and loamy sands on the floodplain. Grassy woodland of white box *(Eucalyptus albens*), yellow box *(Eucalyptus melliodora*), forest red gum *(Eucalyptus tereticornis*) and rough-barked apple (*Angophora floribunda*).

Grg Goulburn River Gorges SB Kerrabee

Incised gorge with steep slopes through Triassic and Jurassic quartz sandstones, shale and conglomerate, general elevation 250 to 400m, local relief 80m. Rock outcrop and stony colluvium with coarse sand matrix on the slopes, sandy alluvium on the valley floor. Slopes carry woodland of red ironbark *(Eucalyptus sideroxylon*), grey gum *(Eucalyptus punctata*), blue-leaved stringybark *(Eucalyptus agglomerata*), narrow-leaved stringybark *(Eucalyptus sparsifolia*), black cypress pine (*Callitris endlicheri*) and forest oak (*Allocasuarina torulosa*). Yellow box *(Eucalyptus melliodora*) and river oak (*Casuarina cunninghamiana*) along the stream channel.

Lpf Lees Pinch Foothills SB Kerrabee

Stony plateau, rugged hills and ridges with narrow valleys on Triassic and Jurassic quartz sandstones, shale and conglomerate, general elevation 250 to 750m, local relief 300m. Extensive rock outcrops with low cliffs and benches, coarse sandy soils with rubbly debris on steep slopes, accumulations of alluvial sand in the valleys and yellow texture-contrast soils on some benches. Woodland of red ironbark *(Eucalyptus sideroxylon*), grey gum *(Eucalyptus punctata*), blue-leaved stringybark *(Eucalyptus agglomerata*), narrow-leaved stringybark *(Eucalyptus sparsifolia*), black cypress pine (*Callitris endlicheri*) and forest oak (*Allocasuarina torulosa*) on the slopes and ridges. Grey gum, brown bloodwood (*Corymbia trachyphloia*), and stringybarks (*Eucalyptus* sp.) with sparse ground cover in creeks and at the base of cliffs. Scattered forest red gum *(Eucalyptus tereticornis*) and ironbark along streams.

Gru Upper Goulburn Valleys and Escarpment SB Kerrabee

Steep hills and sandstone escarpments with cliffs, rock outcrop and long debris slopes on Permian and Triassic quartz sandstone, lithic sandstone, conglomerate and shale, general elevation 250 to 700m, local relief to 250m. Stony coarse textured rubbly earths and harsh texture-contrast soils. Woodland of; grey box *(Eucalyptus moluccana*), forest red gum *(Eucalyptus tereticornis*), white box *(Eucalyptus albens*), yellow box *(Eucalyptus melliodora*) and grasses. Rainforest elements in protected sites.

Meso: SB Moss Vale

Ffe Fitzroy Falls Escarpment SB Moss Vale

High cliffs with waterfalls at the margin of the Fitzroy Falls Plateau landscape, on upper Permian and lower Triassic coal measures of shale, sandstone, tuff and quartz sandstone, general elevation 400 to 700m, local relief 150m. Well-drained gradational yellow earth, and uniform sands on the plateau edge, considerable rock outcrop and rubbly debris slope at the base of the cliffs with a coarse sand matrix. Cliff top woodlands of red bloodwood (*Corymbia gummifera*), scribbly gum *(Eucalyptus haemostoma*), silvertop ash *(Eucalyptus sieberi*) and Sydney peppermint *(Eucalyptus piperita*). Forest under the escarpment contains rainforest elements including turpentine (*Syncarpia glomulifera*), sassafras (*Doryphora sassafras*) and coachwood (*Ceratopetalum apetalum*).

Ffp Fitzroy Falls Plateau SB Moss Vale

Plateau and slightly undulating hills on horizontal Triassic quartz sandstone and conglomerate, general elevation 700 to 780m, local relief 40m. Well-drained gradational yellow earth and uniform sands with some texture-contrast profiles on shale layers or colluvial clay. Sydney peppermint *(Eucalyptus piperita*), scribbly gum *(Eucalyptus haemostoma*), stringybark (*Eucalyptus* sp.), old man banksia (*Banksia serrata*) with a shrubby understorey including mountain devil (*Lambertia formosa*), broad-leaved hakea (*Hakea dactyloides*) and sunshine wattle (*Acacia terminalis*).

Mvh Moss Vale Highlands SB Moss Vale

Rolling hills and rounded peaks with deep channel incision on horizontal Triassic alternating quartz sandstone and shale, general elevation 700 to 850mm, local relief 80m. Widespread yellow and grey texture-contrast soils, deep yellow earth on friable sandstone often with

concretionary ironstone and accumulations of clan quartz sand in valleys. Woodland of silvertop ash *(Eucalyptus sieberi*), Sydney peppermint *(Eucalyptus piperita*), smooth-barked apple (*Angophora costata*), blue-leaved stringybark *(Eucalyptus agglomerata*) and scribbly gum *(Eucalyptus haeomstoma*) on sheltered sites. Open forest in gullies at the head of rivers below the plateau; gully gum *(Eucalyptus smithii*), river peppermint *(Eucalyptus elata*), mountain grey gum *(Eucalyptus cypellocarpa*). Woodland of; mountain grey gum, coastal white box *(Eucalyptus quadrangulata*), white stringybark *(Eucalyptus globoidea*), swamp gum *(Eucalyptus ovata*), and cabbage gum *(Eucalyptus amplifolia*) on shale and poorly drained sites. Large areas of wet heath with; prickly broom heath (*Monotoca scoparia*), coral heath (*Epacris microphylla*), Christmas bells (*Blandfordia nobilis*) and button grass (*Gymnoschoenus sphaerocephalus*) with patches of; stunted silvertop ash, red bloodwood (*Corymbia gummifera*), and scrub she-oak (*Allocasuarina paludosa*).

Wgs Wingecarribee Swamp SB Moss Vale

Extensive sphagnum (*Sphagnum christatum*), common reed (*Phragmites australis*), cumbungi (*Typha orientalis*) and sedge (*Lepyrodia anarthrai*) bog with open water on Holocene peat with a Triassic quartz sandstone base, elevation 740m, local relief <5m, peat 1 to 4m thick. The largest montane bog in Australia contains several rare plants and fauna and was subject to a catastrophic peat burst in 1998 initiated by dredging. Rare species include; *Gentiana wingecarribiensis*, *Lysimachia vulgaris* and *Prasophyllum uroglossum*. Woodland margin of mountain grey gum (*Eucalyptus cypellocarpa*).

Meso: SB Moss Vale Basalts

Rbb Robertson Basalts SB Moss Vale Basalts

Flat top hills and small plateau standing above undulating shale hills of the Moss Vale Highlands landscape on Tertiary basalt flows, general elevation 800 to 850m, local relief 40m. Red and red-brown structured loam and clay loam with uniform or gradational profiles, good water holding capacity and high fertility. Tall forests of; Sydney peppermint *(Eucalyptus piperita*), river peppermint *(Eucalyptus elata*), brown barrel *(Eucalyptus fastigata*), manna gum *(Eucalyptus viminalis*), coastal grey box *(Eucalyptus moluccana*), black sallee *(Eucalyptus stellulata*) and snow gum *(Eucalyptus pauciflora*). Rainforest elements in protected gorges; sassafras (*Doryphora sassafras*), coachwood (*Ceratopetalum apetalum*), eastern leatherwood (*Eucryphia moorei*), native tamarind (*Diploglottis australis*), white cherry (*Schizomeria ovata*), lilly pilly (*Acmena smithii*), blackwood (*Acacia melanoxylon*), small-leaved fig (*Ficus obliqua*) with soft tree-fern (*Dicksonia antarctica*) and rough tree-fern (*Cyathea australis*) understorey.

Meso: SB Pittwater

Bsl Belrose Coastal Slopes SB Pittwater

Benched hill slopes and deep valleys of the coastal fall on horizontal Triassic quartz sandstone, lithic sandstone and shales. High proportion of rock outcrop with discontinuous cliffs to 5m high. General elevation 0 to 180m, local relief 80m. Shallow uniform or gradational sands and earthy sands on ridges, deeper sands, loamy sands and organic sands on wet benches and in hanging swamps, grey or yellow texture-contrast soils on shale benches. Accumulations of deeper sand and occasional podsols in depositional sites and along streams. Low woodland of scribbly gum (*Eucalyptyus haeomostoma*), red bloodwood (*Corymbia gummifera*), yellow-top ash *(Eucalyptus leuhmanniana*), and narrow-leaved apple (*Angophora bakeri*) in deeper soils on ridges. Scrub and heath of she-oak (*Allocasuarina distyla*) and heath banksia (*Banksia ericifolia*), with other *Hakea, Grevillea*, and *Baeckea* sp., on ridges and upper benches. Wet heath and swamps with *Gahnia* sp. and swamp banksia (*Banksia robur*) in hanging valleys. Coastal forest in sheltered areas on better quality shale soil with; Sydney blue gum *(Eucalyptus saligna*), blackbutt *(Eucalyptus pilularis*), turpentine

(*Syncarpia glomulifera*), grey ironbark *(Eucalyptus paniculata*), spotted gum *(Corymbia maculata*), southern mahogany *(Eucalyptus botryoides*), cabbage-tree palm (*Livistona australis*) and burrawang (*Macrozamia* sp.). Coastal headlands with scrub of *Allocasuarina distyla*, coast rosemary (*Westringea fruticosa*), and dwarf kangaroo grass (*Themeda triandra*).

Mav Mangrove Creek Valley SB Pittwater

Incised valley within stepped slopes of horizontal Triassic quartz and lithic sandstones with limited conglomerate and shale, sandy Quaternary alluvium on the narrow valley floor, general elevation 0 to 100m, local relief 50m. Shallow uniform or gradational sands and earthy sands on ridges, deeper sands, loamy sands and organic sands on wet benches, grey or yellow texture-contrast soils on shale benches. Accumulations of deeper sand and occasional podsols in depositional sites and along streams. Woodlands and low forest of yellow bloodwood (*Corymbia eximia*), red bloodwood (*Corymbia gummifera*) and grey gum *(Eucalyptus punctata*) on the ridges and upper slopes, smooth-bark apple (*Angophora costata*), and Sydney peppermint *(Eucalyptus piperita*) in gullies and moist aspects, forest red gum *(Eucalyptus tereticornis*) and thin-leaved stringybark *(Eucalyptus eugenioides*) on lower slopes grading into round-leaved gum *(Eucalyptus deanei*) and rough-barked apple (*Angophora floribunda*) on the alluvial flats. Diverse shrubby understorey.

Poj Port Jackson Basin SB Pittwater

Deep elongated harbour with steep cliffed margins on horizontal Triassic quartz sandstone. Small pocket beaches and more extensive Quaternary estuary fill of muddy sand at the head of most tributary streams. General elevation 0 to 80m, local relief 10 to 50m. Sandstone slopes and cliffs have patches of uniform or gradational sandy soil on narrow benches and within joint crevices that support forest and woodland of Sydney peppermint *(Eucalyptus piperita*), smooth-barked apple (*Angophora costata*), red bloodwood (*Corymbia gummifera*) and blackbutt *(Eucalyptus pilularis*). Sheltered gullies contain some turpentine (*Syncarpia glomulifera*), coachwood (*Ceratopetalum apetalum*) and water gum (*Tristaniopsis laurina*). Estuarine sands were originally dominated by saltmarsh but have been taken over by grey mangrove (*Avicennia marina*) in the past century.

Spp Somersby Plateau SB Pittwater

Plateau of quartz sandstone with occasional shale caps. General elevation 200 to 250m, local relief to 30m. Horizontal Triassic quartz sandstone with thin conglomerates and shale ridge caps. Older Triassic lithic and quartz sandstones exposed in valleys and along the coast. Deep yellow earths or rocky outcrop on plateau tops. Uniform and texture-contrast soils on sandstones and shale slopes. Loamy sand in alluvium along creeks. Shale caps support tall forest of Sydney blue gum *(Eucalyptus saligna*) and blackbutt *(Eucalyptus pilularis*) or turpentine (*Syncarpia glomulifera*) and grey ironbark *(Eucalyptus paniculata*). Sandstone plateau carry Sydney peppermint *(Eucalyptus piperita*), smooth-barked apple (*Angophora costata*), scribbly gum (*Eucalyptyus haeomostoma*), red bloodwood (*Corymbia gummifera*), yellow bloodwood (*Corymbia eximia*), with diverse shrubs and patches of heath. Blackbutt, turpentine, coachwood (*Ceratopetalum apetalum*) and water gum (*Tristaniopsis laurina*) in deep sheltered gullies. Spotted gum *(Corymbia maculata*), round-leaved gum *(Eucalyptus deanei*), bangalow palm (*Archontophoenix cunninghamiana*), and forest oak (*Allocasuarina torulosa*) on lower slopes.

Meso: SB Volcanics

Hrb Hunter River Basalts SB Volcanics

Limited areas of Tertiary basalt caps forming flat-topped or low rounded hills, general elevation 60 to 180m. Red-brown well-structured stony loam, dark cracking clays often with linear gilgai patterns. Open grassy woodland of white box *(Eucalyptus albens*), yellow box

(Eucalyptus melliodora), silvertop stringybark *(Eucalyptus laevopinea*), forest red gum *(Eucalyptus tereticornis*) and bull oak (*Allocasuarina leuhmannii*).

Sbc Sydney Basin Basalt Caps SB Volcanics

High undulating to flat peaks and short ridges on Tertiary basalt above Triassic quartz sandstone, general elevation 700 to 900m, local relief 50 to 100m. Deep uniform red-brown structured loams and clay loams of high fertility. The influence of the basalt on the soil extends down slope of the sandstone/basalt contact. At lower elevations tall moist forest of narrow-leaved peppermint *(Eucalyptus radiata*), brown barrel *(Eucalyptus fastigata*), grey gum *(Eucalyptus punctata*), sassafras (*Doryphora sassafras*), coachwood (*Ceratopetalum apetalum*) and tree-ferns (*Cyathea* sp.).

Dia Sydney Basin Diatremes SB Volcanics

Widely distributed across the Sydney Basin and distinguished as a landscape because they always contain locally different landform, soil and vegetation. Diatremes are circular volcanic vents filled with layered, brecciated country rock cemented by a fine-grained basaltic matrix. Some contain a core of basalt. In sandstone country the volcanic breccia weathers and erodes more rapidly than the sandstone and the landform is a deep circular with the appearance of a crater. Soils in the crater are dominated by sandstone detritus from the surrounding slopes but the subsoils is a fertile well, structured clay derived from the breccia and these protected sites carry more mesic variants of the local vegetation. In shale country the breccia is more resistant than the shale and the diatremes form a low rounded hill with red-brown gradational profiles of clay loam and structured clay with moderate to high fertility. General elevation varies considerably across the basin, local relief of positive landforms up to 25m, negative landforms ('craters') 180m.

Meso: SB Watagan

Wtr Watagan Ranges SB Watagan

Steep dissected ranges with small areas of plateau on Triassic lithic sandstone, shale, tuff and claystone, general elevation 30 to 300m, local relief 100m. Rock outcrop common with low cliff lines and wide benches. Yellow-brown gradational and texture-contrast soil profiles. Complex vegetation varying with aspect, rainfall and fire history. Low shrubs and woodland of scribbly gum (*Eucalyptyus haeomostoma*), red bloodwood (*Corymbia gummifera*), she-oak (*Allocasuarina* sp.), *Banksia* sp., and *Acacia* sp., with patches of silvertop ash *(Eucalyptus sieberi*) and mountain mallee *(Eucalyptus stricta*) on ridges. Slopes with grey ironbark *(Eucalyptus paniculata*), white mahogany *(Eucalyptus acmenoides*), descending to smooth-barked apple (*Angophora costata*), turpentine (*Syncarpia glomulifera*), tallow wood *(Eucalyptus microcorys*), brush box (*Lophostemon confertus*) and Sydney blue gum *(Eucalyptus saligna*) with pockets of rainforest in the creeks.

Meso: SB Wollemi

Bpr Bilpin Ridges SB Wollemi

Elongate ridges capped by thin units of horizontal Triassic shale above steep quartz sandstone slopes, general elevation 600 to 640m, local relief 30m. Stony red-brown to brown gradational or texture-contrast soils with moderate fertility and good water-holding capacity. Forests of turpentine (*Syncarpia glomulifera*), red mahogany *(Eucalyptus resinifera*), grey gum *(Eucalyptus punctata*), grey ironbark *(Eucalyptus paniculata*) and white stringybark *(Eucalyptus globoidea*) with diverse shrubby understorey, are sharply demarcated from adjacent sandstone communities.

Bmp Blue Mountains Plateau SB Wollemi

Elevated, dissected plateau of Triassic quartz sandstones. Largely undeformed with prominent sub-horizontal bedding defining a plateau that rises to the west with maximum elevation of

1100m and local relief in cliffed gorges up to 500m. Very strong joint control on stream patterns and cliff lines. Thin shale beds form stepped topography and deeply weathered sandstones form pagoda towers and turrets on gorge margins. Exposed high slopes with dwarf casuarina (*Allocasuarina nana*) heath, Blue Mountains ash (*Eucalyptus oreades*) and silvertop ash (*Eucalyptus sieberi*) woodlands, and perched swamps. Elsewhere heaths, woodlands and forests with very high plant diversity on sandy soils.

Cge Colo River Gorges SB Wollemi

Deep steep sided benched slopes and gorges of the Colo, Capertee and Wolgan Rivers incised into mostly horizontal Permian and Triassic quartz sandstone conglomerate, siltstone, shale and chert, cliff to 80m high, general elevation 200 to 600m, local relief 200m. Steep debris slopes with stony brown sands carry woodland and scrub of; red bloodwood (*Corymbia gummifera*), yellow bloodwood (*Corymbia eximia*), grey gum *(Eucalyptus punctata*), smooth-barked apple (*Angophora costata*), narrow-leaved apple (*Angophora bakeri*), with gully forests of smooth-barked apple, Sydney peppermint *(Eucalyptus piperita*), turpentine (*Syncarpia glomulifera*), blue-leaved stringybark *(Eucalyptus agglomerata*) and numerous *Acacia* sp. Sandy valley floors wider upstream with; round-leaved gum *(Eucalyptus deanei*), Sydney blue gum *(Eucalyptus saligna*), river peppermint *(Eucalyptus elata*), turpentine, water gum (*Tristaniopsis laurina*), lilly pilly (*Acmena smithii*), coachwood (*Ceratopetalum apetalum*) and river oak (*Casuarina cunninghamiana*).

Ecg Erskine Creek Gorge SB Wollemi

Deep steep sided benched slopes of the Erskine Creek gorge incised into mostly horizontal Triassic quartz sandstone conglomerate and siltstone, cliffs to 50m high, above steep debris slopes, general elevation 150 to 250m, local relief 100m. Thin sandy soils in joint crevices and as a matrix to stony debris. Extensive rock outcrop. Steep debris slopes with forest red gum *(Eucalyptus tereticornis*), red stringybark *(Eucalyptus macrorhyncha*), forest oak (*Allocasuarina torulosa*), and scribbly gum (*Eucalyptus haemostoma*). Red bloodwood (*Corymbia gummifera*), turpentine (*Syncarpia glomulifera*), and rainforest elements at the base of the gorge in sandstone.

Grv Grose River Gorge SB Wollemi

Deep steep sided benched slopes and gorge of the Grose River incised into mostly horizontal Triassic quartz sandstone conglomerate, siltstone, and shale, cliffs to 250m high with waterfalls, general elevation 100 to 500m, local relief 300m. The gorge widens upstream and exposes underlying Permian chest, mudstones and conglomerate. Very extensive rock outcrop, thin yellow to yellow-brown silty sand and gravel with occasional white clay layers forming either shallow yellow earths or gleyed texture-contrast profiles. Red bloodwood (*Corymbia gummifera*), turpentine (*Syncarpia glomulifera*), and rainforest elements at the base of the gorge in sandstone. Steep debris slopes below cliff upstream with forest red gum *(Eucalyptus tereticornis*), red stringybark *(Eucalyptus macrorhyncha*), and brittle gum *(Eucalyptus mannifera*). Round-leaved gum *(Eucalyptus deanei*), mountain mountain grey gum (*Eucalyptus cypellocarpa*), yellow stringybark *(Eucalyptus muelleriana*) and gully gum *(Eucalyptus smithii*).

Kbe Kurrajong Fault Scarp SB Wollemi

Dissected and broken slopes on Triassic Quartz sandstone and shale across the Lapstone monocline and Kurrajong fault scarp. Local dips on the sedimentary rocks up to 300, general elevation 100 to 250m, local relief 100m. Abundant rock outcrop with pockets of yellow-brown sand and occasional yellow texture-contrast soils. Open forest with a shrubby understorey of; blue-leaved stringybark *(Eucalyptus agglomerata*), turpentine (*Syncarpia glomulifera*), red bloodwood (*Corymbia gummifera*). Smooth-barked apple (*Angophora costata*), Sydney peppermint *(Eucalyptus piperita*), narrow-leaved peppermint *(Eucalyptus radiata*), grey gum *(Eucalyptus punctata*), blackbutt *(Eucalyptus pilularis*) and she-oaks (*Allocasuarina* sp.). Several streams have formed extensive reed swamps behind the fault

block with deep organic sands and scattered forest red gum *(Eucalyptus tereticornis*), rough-barked apple (*Angophora floribunda*) and white stringybark *(Eucalyptus globoidea*) on the margins.

Lse Lapstone Slopes SB Wollemi

The frontal slope of the Blue Mountains formed by folding and faulting of Triassic quartz sandstone and shale with a veneer of Tertiary river gravels. A southern extension of the Kurrajong Fault Scarp landscape. Larger streams cut through the structural ridge in deep gorges, but smaller streams have accumulated organic sands in swamps and lagoons on the western side of the flexure. General elevation 50 to 300m, local relief 180m, steep dip slopes on the eastern face and benched faulted slopes on the west. Extensive rock outcrop, thin sandy soils with gravel and occasional white or yellow clay subsoils. Pockets of deep sand in some streams. Red bloodwood (*Corymbia gummifera*), yellow bloodwood (*Corymbia eximia*), grey gum *(Eucalyptus punctata*), forest oak (*Allocasuarina torulosa*), silvertop ash *(Eucalyptus sieberi*), narrow-leaved peppermint *(Eucalyptus radiata*) with diverse shrubby understorey.

Mel Mellong Range SB Wollemi

Undulating rounded broad crests and wide interfluves on Triassic sandstones with thin shales, general elevation 380m, local relief 40m. Thin sand and loamy sand on slopes, deeper sand accumulations or white to pale yellow clays and thin texture-contrast soils on the valleys. Woodland of red bloodwood (*Corymbia gummifera*), smooth-barked apple (*Angophora costata*), grey gum *(Eucalyptus punctata*), scribbly gum *(Eucalyptus sclerophylla*), narrow-leaved peppermint *(Eucalyptus radiata*), narrow-leaved apple (*Angophora bakeri*) with *Banksia* sp., *Acacia* sp., and *Leptospermum* sp., understorey.

Npp Newnes Plateau SB Wollemi

Undulating high level plateau with shallowly incises swampy streams and occasional relic sand dunes on horizontal Triassic quartz sandstones and shale, general elevation 1000m, local relief <100m. Thin stony yellow red sands, deep yellow earths, podsols on dunes and yellow or grey texture-contrast soils on shale units. Woodland of stunted scribbly gum *(Eucalyptus sclerophylla*), snow gum *(Eucalyptus pauciflora*), Blue Mountains ash (*Eucalyptus oreades*), silvertop ash *(Eucalyptus sieberi*), grey ironbark *(Eucalyptus paniculata*), red bloodwood (*Corymbia gummifera*) and grass trees (*Xanthorrhoea* sp.) with numerous other shrubs. Patches of dwarf casuarina (*Allocasuarina nana*) heath on very exposed and eroded aspects, sedge swamps with marginal heath form linear patterns in open valleys.

Pss Putty Sands SB Wollemi

Gently sloping wide valleys with extensive swamps on the upper margin of the Mellong Range landscape. Valleys narrow downstream into shallow sandstone gorges, general elevation 360m, local relief 20m. Uniform or gradation sand or silty sand sometimes over pallid clay. Well-developed podsols in deeper clean sand. Open grassland with fringing scattered drooping red gum *(Eucalyptus parramattensis*), scribbly gum *(Eucalyptus sclerophylla*), and narrow-leaved apple (*Angophora bakeri*). Red bloodwood (*Corymbia gummifera*), scribbly gum *(Eucalyptus sclerophylla*), Christmas bush (*Ceratopetalum gummiferum*), old man banksia (*Banksia serrata*) and woody pear (*Xylomelum pyriforme*) on podsols. *Lepyrodia scariosa* and *Schoenus brevifolius* in swamps on organic sand.

Wmr Wollemi Ranges SB Wollemi

Strongly undulating ranges and dissected plateau on horizontal Triassic quartz and lithic sandstones, conglomerate and some shale, general elevation 300 to 800m, local relief 200m. Extensive rock outcrop with thin sandy soils in joint crevices and on benches. Steeper slopes below plateau remnants with iron cemented gravels, gradational yellow earth and yellow texture-contrast profiles. Woodland and heaths on the plateau with red bloodwood (*Corymbia gummifera*), smooth-barked apple (*Angophora costata*), blue-leaved stringybark *(Eucalyptus agglomerata*), silvertop ash *(Eucalyptus sieberi*) and snow gum *(Eucalyptus pauciflora*).

Marginal slopes with scribbly gum *(Eucalyptus sclerophylla*), red bloodwood, grey ironbark *(Eucalyptus paniculata*), patches of mountain mallee (*Eucalyptus stricta*) and diverse shrubs. Deep valleys with rainforest elements and rare species.

Wow Wollongambe Plateau SB Wollemi

Highest parts of the northern Blue Mountains, general elevation 1000 to 1100m, local relief 100m. Sandstone plateau with benched rock outcrops. Creek directions controlled by jointing with deep gorges of the Capertee and Wolgan Rivers. Hawkesbury Sandstone and equivalent quartz sandstones of Narrabeen Group, sub-horizontal bedding, strong vertical joint patterns. A few volcanic necks. Thin sands or deep yellow earths on plateau, thin texture-contrast soils on shale benches. Organic sand in swamps and joint crevices. Bouldery debris slope below cliffs, sandy alluvium in pockets along the streams. Red brown structured loams on basalts. Red bloodwood (*Corymbia gummifera*), yellow bloodwood (*Corymbia eximia*), rough-barked apple (*Angophora floribunda*), smooth-barked apple (*Angophora costata*), hard-leaved scribbly gum *(Eucalyptus sclerophylla*), and grey gum *(Eucalyptus punctata*) with diverse shrubs and heaths on plateau. Smooth-barked apple, Sydney peppermint *(Eucalyptus piperita*), blue-leaved stringybark *(Eucalyptus agglomerata*), and turpentine (*Syncarpia glomulifera*) and rainforest elements in gullies and canyon heads. Manna gum *(Eucalyptus viminalis*) and Blaxland's stringybark *(Eucalyptus blaxlandii*) on basalt. River oak (*Casuarina cunninghamiana*) along main streams.

Meso: SB Wyong

Gcs Gosford - Cooranbong Coastal Slopes SB Wyong

Coastal fall of the Sydney Basin, rolling hills and sandstone plateau outliers of Triassic Narrabeen sandstones, extensive rock outcrop and low cliffs along ridge margins, general elevation 0 to 75m. Texture-contrast soils on lithic sandstones and shales. Loamy sand alluvium along creeks. Organic sand and mud in lagoons and swamps. Open forest and woodland of smooth-barked apple (*Angophora costata*), red bloodwood (*Corymbia gummifera*), brown stringybark *(Eucalyptus capitellata*), Sydney peppermint *(Eucalyptus piperita*), spotted gum *(Corymbia maculata*), bastard mahogany *(Eucalyptus carnea*), northern grey ironbark *(Eucalyptus siderophloia*) and grey gum *(Eucalyptus punctata*) on hills and slopes. Small areas of closed forest with; turpentine (*Syncarpia glomulifera*), lilly pilly (*Acmena smithii*), mountain cedar wattle (*Acacia elata*), coachwood (*Ceratopetalum apetalum*), sassafras (*Doryphora sassafras*) and water gum (*Tristaniopsis laurina*) in gullies under high escarpments Prickly-leaved tea-tree (*Melaleuca stypheliodes*) and other shrubs with swamp mahogany *(Eucalyptus robusta*), swamp oak (*Casuarina glauca*), sedges and common reed (*Phragmites australis*) on swampy creek flats. Coastal heath subject to salt spray on headlands.

Sna Sydney - Newcastle Coastal Alluvial Plains SB Wyong

Undulating plains and low rises on Quaternary sand or Permian/Triassic sandstone or shale with swampy valley floors. General elevation 0 to 80m, local relief 20m. Siliceous uniform sands, patches of deep podsol and yellow or brown texture-contrast soils on bedrock. Vegetation varies with soil and drainage. On the sands and podsols coast banksia, *Banksia aemula*, red bloodwood (*Corymbia gummifera*) and smooth-barked apple (*Angophora costata*) are common. On bedrock forest oak (*Allocasuarina torulosa*), grey gum *(Eucalyptus punctata*), forest red gum *(Eucalyptus tereticornis*), and scribbly gum *(Eucalyptus haemostoma*), with a shrubby understorey are common and the swamps are typically surrounded by broad-leaved paperbark (*Melaleuca quinquenervia*), coast banksia (*Banksia integrifolia*), swamp oak (*Casuarina glauca*) and swamp mahogany *(Eucalyptus robusta*) with spike rushes (*Eleocharis* sp.) and tall swamp sedge (*Gahnia* sp.). Open water supports a variety of aquatic plants including; common reed (*Phragmites australis*), floating pondweed (*Potamogeton tricarinatus*), water primrose (*Ludwigia peploides*) duckweed (*Lemna* sp.), water buttons (*Cotula coronopifolia*) and red azolla (*Azolla filiculoides*).

Meso: SB Yengo

Bxr Blaxlands Ridge SB Yengo

Undulating dissected ridges with dendritic drainage network on horizontal Triassic quartz sandstone and shale, a few linear cappings of shale comparable to the Bilpin Ridges landscape, general elevation 190 to 250m, local relief 50m. Moderate amounts of rock outcrop, thin sand accumulations in joint crevices, red and yellow texture-contrast soils on wider benches underlain by shale. Woodland and forest of grey ironbark *(Eucalyptus paniculata*), narrow-leaved ironbark *(Eucalyptus crebra*), mountain grey gum *(Eucalyptus cypellocarpa*) and turpentine (*Syncarpia glomulifera*) with diverse shrubs and kangaroo grass (*Themeda triandra*).

Brr Bucketty Ridges SB Yengo

Undulating dissected ridges with dendritic drainage network on horizontal Triassic quartz sandstone and shale, general elevation 200 to 320m, local relief 60m. Moderate amounts of rock outcrop, thin sand accumulations in joint crevices, red and yellow texture-contrast soils on wider benches underlain by shale. Shrubland and open forest of spotted gum *(Corymbia maculata*), grey box *(Eucalyptus moluccana*), narrow-leaved ironbark *(Eucalyptus crebra*), broad-leaved ironbark *(Eucalyptus fibrosa* ssp. *fibrosa*) and forest oak (*Allocasuarina torulosa*). Diverse shrubs in the understorey.

Hag Hawkesbury Gorge SB Yengo

Steep stepped slopes with frequent cliffs to 15m high on horizontal Triassic quartz sandstone, general elevation 0 to 200m, local relief 150m. Extensive rock outcrop and limited soil, sands and loamy sands on benches and within joint crevices. Open forest of red bloodwood (*Corymbia gummifera*), grey gum *(Eucalyptus punctata*), yellow bloodwood (*Corymbia eximia*), scribbly gum *(Eucalyptus haemostoma*), forest oak (*Allocasuarina torulosa*) and smooth-barked apple (*Angophora costata*) with diverse shrubs on ridges and upper slopes. Gully forest of smooth-barked apple, Sydney peppermint *(Eucalyptus piperita*), blue-leaved stringybark *(Eucalyptus agglomerata*) and turpentine (*Syncarpia glomulifera*), with round-leaved gum *(Eucalyptus deanei*), Sydney blue gum *(Eucalyptus saligna*) and rough-barked apple (*Angophora floribunda*) in the most sheltered sites. Plant species differ with slope aspect and fire history.

Hra Howes Range SB Yengo

Closely dissected plateau with broad ridges horizontal Triassic quartz sandstone and narrow deep valleys incised into Triassic lithic sandstone and shale, general elevation 100 to 370m, local relief 120m. Extensive rock outcrop, thin sand accumulations in joint crevices, red and yellow texture-contrast soils on wider benches underlain by shale, rubbly debris slopes beneath cliffs on the sides of valleys. Plateau woodland of red bloodwood (*Corymbia gummifera*), yellow bloodwood (*Corymbia eximia*), smooth-barked apple (*Angophora costata*), grey gum *(Eucalyptus punctata*) and narrow-leaved apple (*Angophora bakeri*). Lower slopes; smooth-barked apple, Sydney peppermint *(Eucalyptus piperita*), blue-leaved stringybark *(Eucalyptus agglomerata*), and turpentine (*Syncarpia glomulifera*). Diverse shrubs in the understorey.

Mdf MacDonald Channel and Floodplain SB Yengo

Meandering channel and sandy floodplain of the MacDonald River on Quaternary and recent quartz sand, general elevation 0 to 60m, local relief 5 to 10m, landform substantially changed by flooding and sediment accumulation in the past 50 years. Deep quartz sand and loamy sand with little soil development beyond the accumulation of organic matter. Originally sheltered forest with round-leaved gum *(Eucalyptus deanei*), Sydney blue gum *(Eucalyptus saligna*), turpentine (*Syncarpia glomulifera*), rough-barked apple (*Angophora floribunda*),

smooth-barked apple (*Angophora costata*), Sydney peppermint *(Eucalyptus piperita*), and blue-leaved stringybark *(Eucalyptus agglomerata*) with river oak (*Casuarina cunninghamiana*) along the banks. The valley floor is cleared and numerous sedge swamps with fringing *Melaleuca linariifolia* are found at the tributary/main floodplain junctions.

Mdr MacDonald Ranges SB Yengo

Undulating dissected benched ridges and plateau with dendritic drainage network on horizontal Triassic quartz sandstone, lithic sandstone, conglomerate and shale, general elevation 50 to 370mm, local relief 180m. Moderate amounts of rock outcrop, thin sand accumulations in joint crevices, red and yellow texture-contrast soils on wider benches underlain by lithic sandstone or shale. Sandstone ridges and steep debris slopes have rubbly brown sands and clayey sands supporting woodland of red bloodwood (*Corymbia gummifera*), yellow bloodwood (*Corymbia eximia*), smooth-barked apple (*Angophora costata*), grey gum *(Eucalyptus punctata*) and narrow-leaved apple (*Angophora bakeri*). Lower slopes; smooth-barked apple, Sydney peppermint *(Eucalyptus piperita*), blue-leaved stringybark *(Eucalyptus agglomerata*), and turpentine (*Syncarpia glomulifera*). Diverse shrubs in the understorey.

Mss Maroota Sands SB Yengo

A single unit of fluvial quartz sands with minor gravel and white clay on the crest of a ridge above the Hawkesbury, general elevation 240m, local relief <10m. The sediments are of uncertain age but appear to be capped by a small remnant of Tertiary basalt. Deep yellow earth and well developed podsol profiles with limited yellow to grey texture-contrast profiles. Woodland of; scaly bark *(Eucalyptus squamosa*), scribbly gum (*Eucalyptus sclerophylla*), red bloodwood (*Corymbia gummifera*), common fringe myrtle (*Calytrix tetragona*), and *Darwinia fascicularis* with diverse shrubs and wetland species on marginal springs.

Umv Upper MacDonald Valleys SB Yengo

Moderately dissected ridges and crests with dendritic drainage on horizontal Triassic lithic sandstone, quartz sandstone, conglomerate and shale, general elevation 50 to 80m, local relief 20m.Terraced valley floors with Quaternary and recent sand. Forests and woodlands of; smooth-barked apple (*Angophora costata*), Sydney peppermint *(Eucalyptus piperita*), blue-leaved stringybark *(Eucalyptus agglomerata*), and turpentine (*Syncarpia glomulifera*).

Yen Yengo Plateau SB Yengo

Deep gorges expose Silurian volcanics and Carboniferous granite in underlying Lachlan Fold Belt. Limited Tertiary basalt with river gravels. Low stepped hills on plateau with deeply incised streams off plateau edge below waterfalls on the escarpment. Alternating sandstone and shale create bare rock benches and soil benches with shallow, often saturated sand. Structured red brown clay loams on basalt. Very prominent 'contour' vegetation pattern. Lichens, mosses and low heath patches on rock, woodlands with dwarfed red bloodwood (*Corymbia gummifera*), silvertop ash *(Eucalyptus sieberi*), tall heath and sedgeland on soil benches. Better soils have messmate *(Eucalyptus obliqua*) and brown barrel *(Eucalyptus fastigata*). Gullies support rainforest elements with turpentine (*Syncarpia glomulifera*), coachwood (*Ceratopetalum apetalum*), lilly pilly (*Acmena smithii*) and mountain pepper (*Tasmannia lanceolata*).

SEC - Descriptions for Landscapes in the South East Corner Bioregion

Meso: SEC Bateman

Clf Clyde Channel and Floodplain SEC Bateman

Channel, floodplain and terraces of the Clyde River in Quaternary alluvium, elevation 0 to 100m, local relief to 15m. Uniform sands and loamy sands on the active floodplain, gradational loams and sandy loams on the first terrace and brown texture-contrast soils on higher terraces. Limited areas of abandoned channel and swamp. Gallery forest of river oak (*Casuarina cunninghamiana*) along the main channel, tall forest of river peppermint *(Eucalyptus elata*) on the floodplains with rough-barked apple (*Angophora floribunda*) and *Acacia* sp., understorey. Patches of temperate rainforest with kanooka (*Tristaniopsis laurina*), grey myrtle (*Backhousia myrtifolia*), sandpaper fig (*Ficus coronata*), and cabbage-tree palm (*Livistona australis*) in sheltered areas. Adjacent slopes with open stands of red bloodwood (*Corymbia gummifera*), spotted gum *(Corymbia maculata*), silvertop ash *(Eucalyptus sieberi*) with burrawang (*Macrozamia* sp.) on the forest floor.

Cvh Clyde Valley Foothills SEC Bateman

Hills and ridges on the coastal ramp of the Clyde valley on folded Ordovician sandstone, siltstone, slate and chert. Elevation 50 to 230m, local relief about 100m. Thin stony red and red-yellow texture-contrast soils with sandy A horizons. Open forest of tall spotted gum *(Corymbia maculata*), grey ironbark *(Eucalyptus paniculata*), red bloodwood (*Corymbia gummifera*), white stringybark *(Eucalyptus globoidea*), blackbutt *(Eucalyptus pilularis*) with blady grass (*Imperata cylindrica*), bracken (*Pteridium esculentum*) and burrawang (*Macrozamia* sp.) in the understorey, shrubs limited.

Mrf Moruya Channels and Floodplains SEC Bateman

Channel, floodplain and terraces of the deep, narrow valley of Quaternary alluvium of the Moruya and Deua Rivers from the coast to the base of the Great Escarpment. Elevation 0 to 200m. Uniform sands and loamy sands on the active floodplain, gradational loams and sandy loams on the first terrace and brown texture-contrast soils on higher terraces. Limited areas of abandoned channel and swamp. Gallery forest of river oak (*Casuarina cunninghamiana*) along the main channel, tall forest of river peppermint *(Eucalyptus elata*) on the floodplains with rough-barked apple (*Angophora floribunda*) and *Acacia* sp., understorey. Patches of temperate rainforest with kanooka (*Tristaniopsis laurina*), grey myrtle (*Backhousia myrtifolia*), sandpaper fig (*Ficus coronata*), and cabbage-tree palm (*Livistona australis*) in sheltered areas. Adjacent slopes with open stands of red bloodwood (*Corymbia gummifera*), spotted gum *(Corymbia maculata*), silvertop ash *(Eucalyptus sieberi*) with burrawang (*Macrozamia* sp.,) on the forest floor. Small patches of temperate rainforest with sassafras (*Doryphora sassafras*) and lilly pilly (*Acmena smithii*) in gully heads and as a gallery forest along major streams in sheltered locations.

Mvf Moruya Valley Foothills SEC Bateman

Extensive low ranges and undulating hills on folded Ordovician sandstone, siltstone, slate and chert and synclinal fold of Devonian sandstone, quartzite, conglomerate, minor shale, rhyolite and rhyolitic breccia. Elevation 50 to 300m. Thin stony red and red-yellow texture-contrast soils. Small patches of temperate rainforest with sassafras (*Doryphora sassafras*) and lilly pilly (*Acmena smithii*) in gully heads and as a gallery forest along major streams in sheltered locations.

Meso: SEC Bateman Basalts

Tcb Tuross Basalts and Sands SEC Bateman Basalts

Low flat hills near the coast on Tertiary basalts and underlying quartz gravel and sand, elevation 0 to 50m. Well-structured, fertile, brown to red-brown loams and clay loams on basalt with Bleached sandy podsols with thin iron pan development on the sands with red bloodwood (*Corymbia gummifera*) and old man banksia (*Banksia serrata*). On the coastal headlands heaths of bushy needlewood (*Hakea sericea*), giant honey-myrtle (*Melaleuca*

armillaris), coast rosemary (*Westringia friticosa*) and dwarfed red bloodwood (*Corymbia gummifera*) occur in shallow soils subject to high salt spray input and frequent fire.

Meso: SEC Bateman Coastal Barriers

Mob Moruya Barrier SEC Bateman Coastal Barriers
Beach, dune and lagoon complex of Quaternary quartz sands, elevation 0 to 20m. Moderate carbonate content in frontal dune transitions to simple podsols with organic pan and diffuse iron pans on the most inland dunes. Organic silty sands in lagoons and estuary. Coast spinifex (Sp*inifex hirsutus*) and mat-rush (*Lomandra* sp.), at the rear of the beach, coast tea-tree (*Leptospermum laevigatum*), coast banksia (*Banksia integrifolia*) and coast wattle (*Acacia longifolia* ssp. *sophorae*) on the frontal dune, old man banksia (*Banksia serrata*), red bloodwood (*Corymbia gummifera*) on inland dunes. Swamp paperbark (*Melaleuca* sp.), swamp oak (*Casuarina glauca*) and rushes on margins of lagoons in brackish sectors giving way to common reed (*Phragmites australis*) in fresh water areas.

Meso: SEC Bateman Granites

Mgb Moruya Granite Basins SEC Bateman Granites
Rounded hills, dendritic drainage on Carboniferous granodiorite and diorite stocks, general elevation 50 to 300m. Rounded granite tors common on ridges and crests, red and yellow sandy texture-contrast soils. Forests of; red bloodwood (*Corymbia gummifera*), yellow stringybark *(Eucalyptus muelleriana*), white stringybark *(Eucalyptus globoidea*), mountain mountain grey gum (*Eucalyptus cypellocarpa*), silvertop ash *(Eucalyptus sieberi*), blackbutt *(Eucalyptus pilularis*) and spotted gum *(Corymbia maculata*) with burrawang (*Macrozamia* sp.).

Meso: SEC Budawangs

Bdr Budawangs Range SEC Budawangs
Eastern half: moderate slopes, rising hills and ridges on folded Ordovician sandstone, siltstone, slate and chert. Elevation 100 to 400m. Thin stony red and red-yellow texture-contrast soils. Forests of Sydney peppermint *(Eucalyptus piperita*), spotted gum *(Corymbia maculata*), yertchuck *(Eucalyptus consideniana*), white stringybark *(Eucalyptus globoidea*), and red bloodwood (*Corymbia gummifera*).

Western half and part of the Great Escarpment: steep rocky ridges and ranges of a prominent synclinal fold in Devonian sandstone, quartzite, conglomerate, minor shale, rhyolite and rhyolitic breccia. Elevation 400 to 1150m, local relief to 600m. Thin stony red and red-yellow texture-contrast soils. Forest of grey ironbark *(Eucalyptus paniculata*) and woollybutt (*Eucalyptus longifolia*) rising to silvertop ash *(Eucalyptus sieberi*), brown barrel *(Eucalyptus fastigata*), messmate *(Eucalyptus obliqua*), mountain mountain grey gum (*Eucalyptus cypellocarpa*), then narrow-leaved peppermint *(Eucalyptus radiata*) and snow gum *(Eucalyptus pauciflora*).

Meso: SEC Coastal Barriers

Teb Tuross - Eden Barriers and Beaches SEC Coastal Barriers
Beach, dune and lagoon complex of Quaternary quartz sands, elevation 0 to 20m. Moderate carbonate content in frontal dune transitions to simple podsols with organic pan and diffuse iron pans on the most inland dunes. Organic silty sand in lagoons and estuary. Coast spinifex (*Spinifex hirsutus*) and mat-rush (*Lomandra* sp.), at the rear of the beach, coast tea-tree (*Leptospermum laevigatum*), coast banksia (*Banksia integrifolia*) and coast wattle (*Acacia longifolia* ssp. *sophorae*) on the frontal dune, old man banksia (*Banksia serrata*), red bloodwood (*Corymbia gummifera*) on inland dunes. Swamp paperbark (*Melalleuca* sp.),

swamp oak (*Casuarina glauca*) and rushes on margins of lagoons in brackish sectors giving way to common reed (*Phragmites australis*) in fresh water areas. Southern mahogany *(Eucalyptus botryoides*) and blackbutt *(Eucalyptus pilularis*) around swamp margin.

Meso: SEC Coastal Ranges

Bea Bega Coastal Alluvium SEC Coastal Ranges

Channel, floodplain and terraces of the widening alluvial valley of Quaternary alluvium of the Bega River from the coast to the base of the Great Escarpment. Elevation 0 to 200m. Extensive freshwater swamps and billabongs, stunted grey mangrove (*Avicennia marina*) at the mouths of estuaries. Small patches of temperate rainforest with sassafras (*Doryphora sassafras*) and lilly pilly (*Acmena smithii*) in gully heads and as a gallery forest along major streams in sheltered locations.

Bfh Bega Coastal Foothills SEC Coastal Ranges

Low hills with general slope toward the coast on Ordovician quartzite, slate, chert, phyllite. General elevation 0 to 520m, local relief 250m. Thin stony red and red-yellow texture-contrast soils. Open forest of tall spotted gum *(Corymbia maculata*), grey ironbark *(Eucalyptus paniculata*), red bloodwood (*Corymbia gummifera*), white stringybark *(Eucalyptus globoidea*), blackbutt *(Eucalyptus pilularis*) with blady grass (*Imperata cylindrica*), bracken (*Pteridium esculentum*) and burrawang (*Macrozamia* sp.) in the understorey, shrubs limited. On headlands heaths of bushy needlewood (*Hakea sericea*), giant honey-myrtle (*Melaleuca armillaris*), coast rosemary (*Westringia friticosa*) and dwarfed red bloodwood occur in shallow soils subject to high salt spray input and frequent fire.

Csb Bodalla - Nadgee Coastal Sands SEC Coastal Ranges

Beach, dune and lagoon complex of Quaternary quartz sands, elevation 0 to 20m. Moderate carbonate content in frontal dune transitions to simple podsols with organic pan and diffuse iron pans on the most inland dunes. Organic silty sand in lagoons and estuary. Coast spinifex (*Spinifex hirsutus*) and mat-rush (*Lomandra* sp.), at the rear of the beach, coast tea-tree (*Leptospermum laevigatum*), coast banksia (*Banksia integrifolia*) and coast wattle (*Acacia longifolia* ssp. *sophorae*) on the frontal dune, old man banksia (*Banksia serrata*), red bloodwood (*Corymbia gummifera*) on inland dunes. Swamp paperbark (*Melaleuca* sp.), swamp oak (*Casuarina glauca*) and rushes on margins of lagoons in brackish sectors giving way to common reed (*Phragmites australis*) in fresh water areas. Stunted silvertop ash *(Eucalyptus sieberi*) and red bloodwood clumps close to the coast becoming taller inland with, southern mahogany *(Eucalyptus botryoides*), blackbutt *(Eucalyptus pilularis*), rough-barked apple (*Angophora floribunda*), river peppermint *(Eucalyptus elata*), coast grey box *(Eucalyptus bosistoana*), black she-oak (*Casuarina litoralis*) and blue gum *(Eucalyptus globulus*).

Lsh Lower Snowy Gorge SEC Coastal Ranges

Steep sided gorge and rocky channel of the lower Snowy River, on Silurian-Devonian granites and granodiorite intruded into lower Ordovician meta-sediments of slate, chert, quartzite, phyllite and hornfels. General elevation 300 to 400m, local relief nominal 50m. Deep pockets of sand and gravel alluvium with rock outcrop along streams. White box *(Eucalyptus albens*), black cypress pine (*Callitris endlicheri*), white cypress pine (*Callitris glaucophylla*) with patches of yellow box *(Eucalyptus melliodora*) and red stringybark *(Eucalyptus macrorhyncha*) on the slopes; composition varying with aspect and soil type. Fringing river bottlebrush (*Callistemon sieberi*) and Burgan kunzea (*Kunzea ericoides*) on the channel and banks.

Lrs Lower Snowy Ranges Meta-sediments SEC Coastal Ranges

Very steep well-drained slopes of the lower Snowy River gorge in lower Ordovician meta-sediments of slate, chert, quartzite, phyllite and hornfels. General elevation 300 to 800m, local relief 400m. Rain shadow environment, but generally moister than adjacent Lower Snowy River Granites Landscape, estimated 600 to 700mm annual rainfall. Grey-brown and yellow texture-contrast soils. White box *(Eucalyptus albens*), and white cypress pine (*Callitris glaucophylla*) on warm aspects; much of this is single age regeneration possibly from the late nineteenth century. White box *(Eucalyptus albens*) and black cypress pine (*Callitris endlicheri*) on rocky sheltered aspects. Moister environments include: yellow box *(Eucalyptus melliodora*), red stringybark *(Eucalyptus macrorhyncha*), scattered kurrajong (*Brachychiton populneus*) woodland with open understorey dominated by *Acacia* sp., and sparse kangaroo grass (*Themeda triandra*), snow grasses (*Poa* sp.) and spear grasses (*Austrostipa* sp.).

Drm Mt Dromedary - Mumbulla Mountain SEC Coastal Ranges
Steep circular mountain feature on Cretaceous zoned intrusion of monzonite, quartz syenite and diorite into Ordovician slate and phyllite, elevation 50 to 800m, local relief 600m. Large rounded tors and domed rock outcrops on the slopes and peak, gritty red-brown clays with high fertility in joint crevices and on lower slopes. Sub-tropical rainforest elements on upper slopes and in gullies mountain mountain grey gum (*Eucalyptus cypellocarpa*), yellow stringybark *(Eucalyptus muelleriana*), Coast grey box *(Eucalyptus bosistoana*), blue gum (*Eucalyptus globulus*) and forest red gum *(Eucalyptus tereticornis*) around the base.

Iml Mt Imlay Peak SEC Coastal Ranges
Steep circular mountain feature with radial drainage on an isolated area of sub-horizontal middle Devonian sandstone, quartzite, conglomerate and siltstone resting unconformably on Ordovician quartzite, slate and phyllite. Elevation 890m, local relief 700m. Thin stony soils near the summit, deeper red-yellow texture-contrast profiles on lower slopes over Ordovician rocks. White ash *(Eucalyptus fraxinoides*), messmate *(Eucalyptus obliqua*) and the endemic Imlay mallee *(Eucalyptus imlayensis*) near the peak, silvertop ash *(Eucalyptus sieberi*), yellow stringybark *(Eucalyptus muelleriana*), and blue-leaved stringybark *(Eucalyptus agglomerata*) with native cherry (*Exocarpus cupressiformis*), hickory wattle (*Acacia implexa*), narrow-leaved geebung (*Persoonia linearis*) and smooth geebung (*Persoonia levis*) on the slopes. Rainforest elements in the gullies; mountain mountain grey gum (*Eucalyptus cypellocarpa*), river peppermint *(Eucalyptus elata*), mountain pepper (*Tasmannia lanceolata*), soft tree-fern (*Dicksonia antarctica*) and blue olive berry (*Elaeocarpus reticulatus*).

Ndg Nadgee Coastal Range SEC Coastal Ranges
Coastal ranges and hills on middle Devonian sandstone, quartzite, conglomerate and siltstone, and Ordovician sandstone, quartzite and phyllite with some granite. Elevation 0 to 550m. Thin stony soils on ridges, deeper red-yellow texture-contrast profiles on Ordovician rocks. Forest of silvertop ash *(Eucalyptus sieberi*), mountain mountain grey gum *(Eucalyptus cypellocarpa*), gully gum *(Eucalyptus smithii*), white ash *(Eucalyptus fraxinoides*), messmate *(Eucalyptus obliqua*), prickly stringybark *(Eucalyptus consideniana*) and red bloodwood (*Corymbia gummifera*). Gullies with cool temperate and sub-tropical rainforest species such as; eastern leatherwood (*Eucryphia moorei*), prickly tree-fern (*Cyathea leichardtiana*), bolwarra (*Eupomatia laurina*), lilly pilly (*Acmena smithii*) and sweet pittosporum (*Pittosporum undulatum*). Open coastal headland heaths on shallow stony soil of bushy needlewood (*Hakea sericea*), giant honey-myrtle (*Melaleuca armillaris*), coast rosemary (*Westringia friticosa*) and dwarfed red bloodwood on shallow soils subject to high salt spray input and frequent fire. Wet button grass (*Gymnoschoenus sphaerocephalus*) swamps on high peaks.

Twc Towamba Channel and Floodplain SEC Coastal Ranges
Channel, floodplain and terraces of the deep, narrow valley of Quaternary alluvium of the Towamba River from the coast to the base of the Great Escarpment. Elevation 0 to 200m.

Deep loamy sand with little profile development. River oak (*Casuarina cunninghamiana*) along the banks. Small patches of temperate rainforest with sassafras (*Doryphora sassafras*) and lilly pilly (*Acmena smithii*) in gully heads and as a gallery forest along major streams in sheltered locations.

Twb Towamba Granite SEC Coastal Ranges

Westward rising plateau with peaks on Silurian-Devonian granite and granodiorite, general elevation 200-400m, peaks to 750m. Rounded tors and rock outcrop common near the granite margin where a metamorphic contact ridge with steep slopes is found. Coarse uniform sands on steep slopes grade to red gritty texture-contrast soils on the central hills and slopes. Vegeation not well recorded, includes; forest red gum *(Eucalyptus tereticornis*), rough-barked apple (*Angophora floribunda*) and grasses.

Tur Tuross Channel and Floodplain SEC Coastal Ranges

Channel, floodplain and terraces of the deep, narrow valley of Quaternary alluvium of the Tuross River from the coast to the base of the Great Escarpment. Elevation 0 to 200m. Brown uniform and gradational loam with river oak (*Casuarina cunninghamiana*) along the banks. Patches of temperate rainforest with sassafras (*Doryphora sassafras*) and lilly pilly (*Acmena smithii*) in gully heads and as a gallery forest along major streams in sheltered locations.

Meso: SEC Granites

Beg Bega Granites SEC Granites

Depressed basin of rolling hills and wide sandy or swampy valleys with dendritic drainage below the Great Escarpment on a large batholith of Silurian-Devonian granite and granodiorite. Elevation 50 to 500m, local relief to 250m. Rounded tors and rock outcrop common near the granite margin where a metamorphic contact ridge with steep slopes is found. Coarse uniform sands on steep slopes grade to red and yellow gritty texture-contrast soils on the central hills and slopes and deep, dark organic sands in the swampy valley floors. Streams often incised and carry abundant coarse sand as bedload. Mostly cleared formerly open woodland with forest red gum *(Eucalyptus tereticornis*), rough-barked apple (*Angophora floribunda*) and grasses.

Lsi Lower Snowy Granites SEC Granites

Very steep well-drained slopes of the lower Snowy River gorge Silurian-Devonian granites and granodiorite with rounded tors and outcrop on ridges and in streams. General elevation 400 to 900m, local relief to 450m. Coarse uniform sands and grit on granites commonly sheet eroded, limited development yellow and yellow-brown texture-contrast soils. Coarse sands in streambeds, extensive sheet and gully erosion. Rain shadow environment 500-600mm annual rainfall. Woodlands of white box *(Eucalyptus albens*), and white cypress pine (*Callitris glaucophylla*) on warm aspects; much of this is single age regeneration of the 1870s. White box and black cypress pine (*Callitris endlicheri*) on rocky sheltered aspects. Moister environments include: yellow box *(Eucalyptus melliodora*), red stringybark *(Eucalyptus macrorhyncha*), scattered kurrajong (*Brachychiton populneus*) woodland with open understorey dominated by *Acacia* sp., peach heath (*Lissanthe strigosa*) and sparse kangaroo grass (*Themeda triandra*), snow grasses (*Poa* sp.) and spear grasses (*Austrostipa* sp.). Very rare acacia dry scrub communities of red wattle (*Acacia silvestris*) and rock wax-flower (*Eriostemon trachyphyllus*) that are maintained by intense fire are found on volcanic rocks and sedimentary rocks near the top of steep slopes with northerly aspects.

SEH - Descriptions for Landscapes in the South East Highlands Bioregion

Meso: SEH Bathurst

Umc Upper Macquarie Channels and Floodplains SEH Bathurst
Macquarie valley opens wider through the Bathurst granite, general elevation 260 to 420m, local relief 5 to 25m. Limited areas of Tertiary basalt with buried river gravels along the ridges generally parallel to the main stream. Narrow floodplain benches with alluvial sands and gravels with minimal soil development. Red gradational earths and texture-contrast soils on terraces. River oak (*Casuarina cunninghamiana*) dominates the channel, open grassland with sparse yellow box *(Eucalyptus melliodora*) and Blakely's red gum *(Eucalyptus blakelyi*) on the hills.

Meso: SEH Bondo

Brn Bringenbrong Ranges SEH Bondo
Steep structural ranges on Ordovician quartzite, phyllite and slate, general elevation 450 to 1000m, local relief to 400m. Rubbly scree slopes with loam matrix with soil mantle becoming thicker down slope. Open forest of; narrow-leaved peppermint *(Eucalyptus radiata*), broad-leaved peppermint *(Eucalyptus dives*), brittle gum (*Eucalyptus mannifera*), red stringybark *(Eucalyptus macrorhyncha*), manna gum *(Eucalyptus viminalis*), apple box *(Eucalyptus bridgesiana*), yellow box *(Eucalyptus melliodora*) on lower slopes.

Pin Pinbeyan - Ravine Ranges SEH Bondo
Structurally controlled ranges with prominent bluffs to 120m and plateau top on a synclinal fold in Upper Devonian rhyolite, andesitic basalt, tuff, sandstone, conglomerate and siltstone. Elevation 500 to 1400m, local relief 700m. Extensive rock outcrop. Steep debris slope below cliffs with rubbly brown sandy loam grading to red-brown texture-contrast soils on lower slopes. Open woodland of; yellow box *(Eucalyptus melliodora*), narrow-leaved peppermint *(Eucalyptus radiata*), candlebark (*Eucalyptus rubida)*, red stringybark *(Eucalyptus macrorhyncha*) on slopes with mountain gum *(Eucalyptus dalrympleana*) and snow gum *(Eucalyptus pauciflora*) on the plateau. Limited alpine ash *(Eucalyptus delegatensis*) in mid-slope gullies.

Meso: SEH Bondo Basalts

Bub Mt Bundarbo Basalt Caps SEH Bondo Basalts
Flat topped hills and peaks of Tertiary basalt originally deposited as valley flows in a former course of the Murrumbidgee River overlie Silurian-Devonian granite or Silurian dacite, andesite and sandstone. Limited areas of exposed sub-basaltic quartz gravels and sands. General elevation 300 to 600m, local relief 150m. Thin stony brown loams, rubbly slopes with brown loams extend below the lower limit of the basalt onto thin skeletal clays and clay loams from underlying volcanics or deeper gritty clays from granite. Vegetation not known.

Meso: SEH Bondo Granites

Khb Khancoban Basin SEH Bondo Granites
Low basin with undulating hills on Silurian-Devonian deeply weathered granite, intersected by deep alluvium on terraces and floodplain of the Swampy Plains River, elevation 400 to 500m, local relief to 30m. Red-yellow and yellow gritty texture-contrast soils on the granite, uniform dark brown loams and gravelly loams on alluvium. River red gum *(Eucalyptus camaldulensis*) along the stream banks, open yellow box *(Eucalyptus melliodora*) on lower

slopes extending to red stringybark *(Eucalyptus macrorhyncha*), narrow-leaved peppermint *(Eucalyptus radiata*) and candlebark (*Eucalyptus rubida)*, then to alpine ash *(Eucalyptus delegatensis*) and mountain gum *(Eucalyptus dalrympleana*) on higher peaks. Slopes with abundant shrubby understorey including numerous *Acacia* sp., and grass trees (*Xanthorrhoea* sp.).

Tom Tooma Granite Ranges SEH Bondo Granites

Rounded hills, ranges and plateau on Silurian gneissic granite with well-defined rectangular drainage pattern controlled by jointing. General elevation 700 to 1400m. Red and yellow gritty texture-contrast soils merging to gradational profiles at about 1000m. Lower slopes with; red stringybark *(Eucalyptus macrorhyncha*), narrow-leaved peppermint *(Eucalyptus radiata*), candlebark (*Eucalyptus rubida)*, apple box *(Eucalyptus bridgesiana*) abundant shrubby understorey including numerous *Acacia* sp., and grass trees (*Xanthorrhoea* sp.). Upper slopes with; alpine ash and mountain gum *(Eucalyptus dalrympleana*). Snow gum (*Eucalyptus pauciflora*) on higher peaks.

Meso: SEH Bungonia

But Bungonia Tableland and Gorge SEH Bungonia

Tableland on Ordovician and Devonian slate, phyllite and quartzite, a small Carboniferous granodiorite stock, caps of Tertiary quartz sands and gravels and limited basalt. The margin of the tableland is the Great Escarpment and is cut by a 400m deep gorge with vertical walls through west dipping Silurian limestones. Numerous deep caves and dolines present. General elevation 600 to 800m, local relief 500m. Red-brown well structured clay with alkaline pH on limestone, skeletal rubble on scree slopes from slates and volcanics, red and red-yellow texture-contrast profiles over sedimentary rocks on the tableland. Tableland covered by woodland of apple box *(Eucalyptus bridgesiana*), argyle apple *(Eucalyptus cinerea*), broad-leaved peppermint *(Eucalyptus dives*), brittle gum (*Eucalyptus mannifera*), drooping red gum *(Eucalyptus parramattensis*), forest red gum *(Eucalyptus tereticornis*), black wattle (*Acacia mearnsii*), Parramatta wattle (*Acacia parramattensis*), kurrajong (*Brachychiton populneus*), black she-oak (*Casuarina litoralis*) with numerous shrubs and grasses. The same trees extend onto the limestone. Species largely limited to the limestone include; eastern bitter bush (*Adriana glabrata*), silver banksia (*Banksia marginata*), Australian senna (*Senna aciphylla*), narrow-leaf logania (*Logania albiflora*), mock olive (*Motelaea longifolia*), slender westringia (*Westringia eremicola*), and passion flower (*Passiflora herbertiana*). Within the gorge, on scree slopes and at the base of high waterfalls rainforest elements occur including; stinging tree (*Dendrocnide* sp.), Maiden's gum *(Eucalyptus maidenii*), sandpaper fig (*Ficus coronata*), rusty fig (*Ficus rubiginosa*), white cedar (*Melia azedarach*), red cedar (*Toona australis*), bleeding heart (*Omalanthus populifolius*), and sweet pittosporum (*Pittosporum undulatum*). River oak (*Casuarina cunninghamiana*) is abundant along the stream banks with some river peppermint *(Eucalyptus elata*).

Shg Shoalhaven Gorge SEH Bungonia

Gorge tract of the Shoalhaven and main tributaries, strong structural control in plan form; narrow incised meanders, steep scree slopes running to plateau and tableland margins. Incised through many Palaeozoic rock types, slopes capped by sub-horizontal sandstones of the Sydney Basin downstream of the point where the river turns east. General elevation 100 to 500m, local relief up to 250m. Unconsolidated quartz sand and gravels in the bed and banks of the stream supporting dense river oak (*Casuarina cunninghamiana*). Steep slopes with angular scree and interstitial organic sandy loam support open stunted woodlands of local trees and shrubs including figs (*Ficus* sp.). Sheltered gullies with rainforest elements.

Wbg Wollondilly - Bindook Tablelands and Gorges SEH Bungonia

Dissected tablelands, marginal gorges and scree slopes on massive Devonian quartz porphyry and small areas of massive Devonian granite. General elevation 600 to 900m, local relief

250m. Thin gritty uniform profiles on steep slopes and around rock outcrops, grey and yellow texture-contrast profiles on flatter slopes. Woodland and open forest of; forest red gum *(Eucalyptus tereticornis*), yellow box *(Eucalyptus melliodora*), grey box *(Eucalyptus molucanna*), white box *(Eucalyptus albens*), black wattle (*Acacia mearnsii*), Parramatta wattle (*Acacia parramattensis*), black she-oak (*Casuarina litoralis*) with numerous shrubs, bracken (*Pteridium esculentum*) and grasses.

Wva Wollondilly Channel and Floodplain SEH Bungonia
Channel, floodplain and terraces of the Wollondilly River incised into Devonian quartz porphyry and Permian and Triassic sandstones and shales of the Sydney Basin. Gorge tract of the river upstream of Lake Burragorang, general elevation 150 to 500m, local relief to 150m. Quartz sand and gravels in the channel and on the floodplains, yellow texture-contrast soils on the higher terraces. Forest of; yellow box *(Eucalyptus melliodora*), forest red gum *(Eucalyptus tereticornis*), grey box *(Eucalyptus molucanna*) and white box *(Eucalyptus albens*) along lower slopes, river oak (*Casuarina cunninghamiana*) gallery forest on stream banks.

Meso: SEH Bungonia Basalts

Ssb Sassafras-Nerriga Basalts and Gravels SEH Bungonia Basalts
Limited areas of ridge cap Tertiary basalts and exposures of underlying gravel and sand on the edge of the tablelands above the Endrick and Shoalhaven Rivers. General elevation 650m, local relief <20m. Deep red-brown structured clay loams with high fertility, basalt derived soil materials extend down slope onto adjacent bedrocks and most areas are cleared and have been cultivated. Manna gum *(Eucalyptus viminalis*), and blackwood (*Acacia melanoxylon*) are characteristic.

Shs Shoalhaven Tertiary Sands SEH Bungonia Basalts
Undulating partly dissected plains on extensive Tertiary quartz sand sheets, general elevation 600 to 650m, local relief <50m. Some of the sands have been worked into low dunes under a Pleistocene climate and now have uniform deep siliceous sand or yellow earth profiles with forest oak (*Allocasuarina torulosa*), broad-leaved peppermint *(Eucalyptus dives*), brittle gum *(Eucalyptus mannifera*), silver banksia (*Banksia marginata*) and coast banksia (*Banksia integrifolia*) woodlands.

Meso: SEH Canobolas

Cnp Canobolas Peaks SEH Canobolas
Numerous volcanic features; plugs, dykes and domes in the Tertiary Canobolas volcanic complex of trachyte, basalt and pyroclastics forming the highest peaks. Frequent winter snow and frosts, high local rainfall. Elevation 1200 to 1400m. Thin stony alpine humus soils. Mountain gum *(Eucalyptus dalrympleana*), manna gum *(Eucalyptus viminalis*), snow gum *(Eucalyptus pauciflora*) and snow grass (*Poa* sp.).

Cab Canobolas Sheet Basalts SEH Canobolas
Widespread undulating high-level plains on Tertiary basalt flows. General elevation 950 to 1200m, local relief 100m. Shallow red brown to black stony loams, yellow-brown texture-contrast soils on lower slopes, alluvial loams and black clays in swampy valley floors. Woodland with; yellow box *(Eucalyptus melliodora*), Blakely's red gum *(Eucalyptus blackelyi*), red stringybark *(Eucalyptus macrorhyncha*), candlebark (*Eucalyptus rubida*), broad-leaved peppermint *(Eucalyptus dives*), grey box *(Eucalyptus microcarpa*), and apple box *(Eucalyptus bridgesiana*) with grasses.

Meso: SEH Crookwell

Dah Dalton Hills SEH Crookwell

Linear ranges and undulating hills on steep dipping, folded Ordovician quartzose greywacke, slate, chert, phyllite. Dendritic to rectangular drainage network, general elevation 500 to 700m, local relief <100m. Texture-contrast soils dominant. Red on upper slopes grading to harsh yellow clay subsoils with hard setting A horizons on lower slopes. Yellow box *(Eucalyptus melliodora*), white box *(Eucalyptus albens*), grey box *(Eucalyptus microcarpa*), red stringybark *(Eucalyptus macrorhyncha*), scribbly gum *(Eucalyptus rossii*) and grassy woodlands originally dominated by kangaroo grass (*Themeda triandra*) now extensively modified by grazing and cultivation. River oak (*Casuarina cunninghamiana*) along most streams with river red gum *(Eucalyptus camaldulensis*) appearing in the north.

Twr Towrang Ranges SEH Crookwell

Strike ridges and aligned hills with moderate to steep slopes on Devonian and Ordovician folded quartzose sandstone, siltstone, conglomerate shale and slate. Strong structural control of range plan, general elevation 700 to 1000m, local relief to 150m. Shallow stony loams and sandy loams on ridges, grading to yellow and brown texture-contrast soils with prominent bleached A_2 horizons on lower slopes. Sands and loams on alluvium in valley floors that originally had 'chain of ponds' stream form. Woodlands of red stringybark *(Eucalyptus macrorhyncha*), brittle gum (*Eucalyptus mannifera*), scribbly gum *(Eucalyptus rossii*), and broad-leaved peppermint *(Eucalyptus dives*). Open grasslands in narrow valleys, river oak (*Casuarina cunninghamiana*) marginal to the streams.

Meso: SEH Crookwell Basalts

Ckw Crookwell Basalts and Sands SEH Crookwell Basalts

Moderately extensive flat topped tablelands and hills capped by Tertiary basalt with limited exposure of underlying quartz sand and gravel. General elevation 900m, local relief <50m. Stony red-brown and brown structured clay and clay loam, moderate to high fertility. Soil depth varies with substrate, deep on tuffs and breccia, shallow on massive or columnar flow material. Yellow earths on the sands. Open grassy forest of brown barrel *(Eucalyptus fastigata*), manna gum *(Eucalyptus viminalis*), scattered white box *(Eucalyptus albens*), candlebark (*Eucalyptus rubida*), mountain mountain grey gum (*Eucalyptus cypellocarpa*) and snow gum *(Eucalyptus pauciflora*) with kangaroo grass (*Themeda triandra*) and snow grasses (*Poa* sp.). Extensively cleared.

Meso: SEH Hill End

Mtg Macquarie - Turon Gorges SEH Hill End

Steep sided, deep gorge tract with incised meanders of the Macquarie and Turon Rivers below extensive tablelands of the Ophir-Hargraves Plateau landscape. Incised across the structural grain of north-south trending tightly folded Devonian dacite, crystal tuff, quartzite and slates. General elevation 500 to 700m, local relief to 150m. Shallow stony soils on semi-stable scree slopes and yellow texture-contrast soils on lower angle slopes. Open woodland of yellow box *(Eucalyptus melliodora*), red box *(Eucalyptus polyanthemos*) and Blakely's red gum *(Eucalyptus blakelyi*) on lower areas, red stringybark *(Eucalyptus macrorhyncha*), broad-leaved peppermint *(Eucalyptus dives*) and candlebark (*Eucalyptus rubida*), on higher slopes. River oak (*Casuarina cunninghamiana*) dominates the channel.

Mhp Mount Horrible Plateau SEH Hill End

Dissected plateau undulating hills and steep wooded ridges in folded Devonian conglomerates, sandstones, and mudstones. Strong structural control of topography, steep slopes, general elevation 750 to 1300m, local relief 250m. Red gradational well-structured and red texture-contrast soils on crests. Yellow earths on some sandstone, yellow texture-contrast soils with bleached A_2 horizons on lower slopes, dark clay loams and clays in broader creek lines. Strong development of stone layers that may reflect past climate. Snow gum

(Eucalyptus pauciflora) above 1000m particularly on crests. Apple box *(Eucalyptus bridgesiana*), mountain gum *(Eucalyptus dalrympleana*), thin-leaved stringybark *(Eucalyptus eugeniodes*) and white box *(Eucalyptus albens*) on slopes, red stringybark *(Eucalyptus macrorhyncha*), broad-leaved peppermint *(Eucalyptus dives*), candlebark *(Eucalyptus rubida*), brittle gum *(Eucalyptus mannifera*), and some black cypress pine (*Callitris endlicheri*) on ridges. Yellow box *(Eucalyptus melliodora*), Blakely's red gum *(Eucalyptus blakelyi*), manna gum *(Eucalyptus viminalis*) and some brown barrel *(Eucalyptus fastigata*) along streams.

Meso: SEH Hill End Basalts

Mtb Macquarie Valley Basalts SEH Hill End Basalts

Discontinuous flat topped peaks and hillcrests on the upper margin of the Macquarie - Turon Gorges landscape with Tertiary flow basalts and underlying quartz sand and river gravel of a former Macquarie River. General elevation 700 to 750m, local relief 30m with the sub-basaltic sands commonly 200 to 250m above the present river. Stony red-brown and yellow brown structured, friable loam. Open woodland with, long-leaved box (*Eucalyptus nortonii*), mountain gum *(Eucalyptus dalrympleana*), red stringybark *(Eucalyptus macrorhyncha*), narrow-leaved peppermint *(Eucalyptus radiata*) and grasses.

Meso: SEH Kanangra

Byl Boyd Plateau SEH Kanangra

Plateau with extensive swamps, low hills and deeply dissected margin on Devonian sandstone, siltstone, shale and conglomerate. Small areas capped by horizontal Permian lithic sandstone, quartz sandstone, conglomerate and shale. General elevation 1100 to 1250m, local relief <80m. Extensive rock outcrop, thin stony loams on Palaeozoic rocks, thin wet siliceous sands on sandstone and gleyed texture-contrast soils on shale benches. Heath and scrub of mountain mallee *(Eucalyptus stricta*), dwarf casuarina (*Allocasuarina nana*), heath banksia (*Banksia ericifolia*), finger hakea (*Hakea dactyloides*), tea-tree (*Leptospermum* sp.), scribbly gum *(Eucalyptus rossii*) and snow gum *(Eucalyptus pauciflora*).

Meso: SEH Karst

Jnk Jenolan - Wombeyan Karst SEH Karst

Steep peaks and ridges, deep gorges and abundant karst features of caves, dolines, and arches formed in grey and white Silurian limestone, marble and calcareous shales. Adjacent rocks at Jenolan include; Silurian pyroclastics, rhyolite, slate and greywacke. Devonian quartz porphyry at Wombeyan. General elevation at Jenolan 900 to 1000m, and 600-700m at Wombeyan. Extensive rock outcrop with pockets of deep red, red-brown structured clay with alkaline pH. Rubbly scree slopes. Gravel and loamy sand on alluvial flats. Grey-brown texture-contrast soils on adjacent igneous and sedimentary rocks. White stringybark *(Eucalyptus globoidea*) and silvertop ash *(Eucalyptus sieberi*) with wallaby grass (*Austrodanthonia* sp.) and bracken (*Pteridium esculentum*) on igneous rocks. Yellow box *(Eucalyptus melliodora*), kurrajong (*Brachychiton populneus*), shiny cassinia (*Cassinia longifolia*), daisy bush (*Olearia* sp.), and spear grass (*Austrostipa* sp.) on limestone. Chalker's wattle (*Acacia chalkeri*) restricted to limestone at Wombeyan. River oak (*Casuarina cunninghamiana*) along all larger streams.

Meso: SEH Lake Basins

Brl Breadalbane Swamps and Lagoons SEH Lake Basins

Closed drainage basins of Quaternary lakes and swamps set within block faulted ranges. General elevation 680m, local relief of lake beds <15m, rounded hills stand above the plain to 900m. Extensive Tertiary quartz gravels, sands, and mud overlying various bedrock of

Silurian-Devonian gneissic granite. Eastern margins with low sandy lunettes. Maximum lake depths about 2m, may be dry for periods of years or vary in water level over decades. Grey to brown hard sandy clay on lakebeds, yellow earth on lunettes. Evidence of much greater extent and depth during the Pleistocene ice ages. Open grasslands of spear grass (*Austrostipa* sp.) and *Poa* sp. with kangaroo grass (*Themeda triandra*), now extensively altered by exotics. Clumps of sparse stunted snow gums *(Eucalyptus pauciflora*) on low hills and sandy lunettes. Common reed (*Phragmites australis*), cumbungi (*Typha orientalis*), rushes and sedges in creeks and around freshwater seepage areas.

Lgc Lake George Complex SEH Lake Basins

Closed drainage basins of Quaternary lakes and swamps set within block faulted ranges. Extensive Tertiary quartz gravel, sand, and mud overlying Silurian-Devonian gneissic granite and Silurian quartz sandstone and mudstone. General elevation 700m, local relief of lake beds <50m, rounded hills stand above the plain to 900m. Eastern margins with well developed sandy lunettes. Maximum lake depths about 7m, may be dry for periods of years or vary in water level over decades. Evidence of much greater extent and depth during the Pleistocene ice ages. Self-mulching grey clays on the lakebeds, yellow earths on the lunettes. Wet tussock grasslands of spear grass (*Austrostipa* sp.) and *Poa* sp. with kangaroo grass (*Themeda triandra*) on lake margins, now extensively altered by exotics. Clumps of sparse stunted snow gums *(Eucalyptus pauciflora*) on low hills and sandy lunettes. Common reed (*Phragmites australis*) around freshwater seepage areas on lake margins.

Mol Monaro Lakes SEH Lake Basins

Small, perennial to ephemeral lake basins and swamps in the Monaro Plateau rain shadow environment. Most (185) lakes are on Tertiary basalt, with 30 others on Silurian-Devonian granite or Ordovician meta-sediments. The basins are believed to have formed by deflation under a drier Pleistocene climate. The eastern margins have poorly developed beaches and shadows of pelleted clay sediments formed into a low, ill-defined lunette. General elevation 800-1100m above sea level, local relief <100, lakes are typically less than 2m deep. Heavy black clays on basalt and grey gritty clays on granite, both soils with high quantities of organic matter, varying water salinity may be important. Common plant species include: *Myriophyllum simulans, Potamogeton tricarinatus, Eleocharis sphacelata, Eleocharis acuta, Nymphoides montana, Glossostigmata elatinoides, Amphibromus nervosus, Pratia surrepens, Agrostis avenacea, Centipeda cunninghamii, Crassula helmsii, Carax bichenoviana, Ranunculus diminitus, Lepilaena bilocularis* and *Isolepus platycarpa.* The distribution of particular plant associations varies with altitude, local rainfall and lake size (water depth).

Meso: SEH Monaro

Bbs Bombala Meta-sediments SEH Monaro

Rolling hills and low ranges on lower Ordovician quartzose greywacke, siltstone, slate, chert, phyllite and hornfels. Includes small areas of granite. General elevation 500 to 800m, peaks to 1100m. Red and yellow texture-contrast soils common. Open woodland to low forest of snow gum *(Eucalyptus pauciflora*) and black sallee *(Eucalyptus stellulata*) with snow grass (*Poa* sp.). Red stringybark *(Eucalyptus macrorhyncha*), brittle gum (*Eucalyptus mannifera*) on coarser soils, yellow box *(Eucalyptus melliodora*) and Blakely's red gum *(Eucalyptus blakelyi*) with increased moisture give way to brown barrel *(Eucalyptus fastigata*), manna gum (*Eucalyptus viminalis*), broad-leaved peppermint *(Eucalyptus dives*), alpine ash *(Eucalyptus delegatensis*) and mountain gum *(Eucalyptus dalrympleana*) in the highest rainfall areas near the Great Escarpment. Shrubby understorey of *Acacia* sp., shiny cassinia (*Cassinia longifolia*), parrot peas (*Dillwynia* sp.) and hairy hop-bush (*Dodonaea boroniifolia*) with spear grasses (*Austrostipa* sp.).

Byr Byadbo Ranges Meta-sediments SEH Monaro

Dissected mountain ranges and peaks with dense dendritic drainage, in Ordovician quartzose greywacke, slate, chert, phyllite and schist, general elevation 900-1250m. Thin stony soils most commonly yellow texture-contrast profiles. Strong aspect control of vegetation; red stringybark *(Eucalyptus macrorhyncha*) and brittle gum (*Eucalyptus mannifera*), on western slopes, brown barrel *(Eucalyptus fastigata*), manna gum (*Eucalyptus viminalis*), on southern slopes and snow gum *(Eucalyptus pauciflora*) and black sallee *(Eucalyptus stellulata*) communities on higher and wetter ground. Patches of acacia dry scrub of Bodalla silver wattle (*Acacia trachyphloia*), rock wax-flower (*Eriostemon trachyphyllus*), white cypress pine (*Callitris glaucophylla*), black cypress pine (*Callitris endlicheri*), grass tree (*Xanthorrhoea* sp.) and broad-leaf hopbush (*Dodonaea viscosa*) on warm rocky slopes on the western margin.

Cpn Canberra Plains SEH Monaro

Open grassy plains with meandering channels and terraces in Quaternary alluvium of loams and sandy clays with small areas of red-brown sands of source bordering dunes, over Silurian rhyolite and rhyodacite. General elevation 650 to 800 with peaks to 1000. Shallow stony uniform loams on steeper slopes, stony harsh red-brown texture-contrast soils on alluvial fans from ranges, yellow-brown to yellow texture-contrast soils on the alluvium, usually with hard setting and bleached A-horizons. Grasslands of; spear grass (*Austrostipa* sp.), snow grass (*Poa* sp.) with kangaroo grass (*Themeda triandra*) on alluvium, open woodlands of; yellow box *(Eucalyptus melliodora*), Blakely's red gum *(Eucalyptus blakelyi*), red stringybark *(Eucalyptus macrorhyncha*), and black cypress pine (*Callitris endlicheri*), merging into red stringybark, and brittle gum (*Eucalyptus mannifera*) communities on the hills.

Cog Coolangubra - Good Good Plateau SEH Monaro

Ranges, dissected plateau and bluffs on the western side of the Great Escarpment in Silurian-Devonian granite and granodiorite. Rounded hills and peaks, well developed drainage and high waterfalls in high rainfall environment, general elevation 800 to 1400m, local relief to 250m. Rounded tors and rocky outcrops on crests, deep red and red-brown gritty uniform loams on slopes, brown clayey sand alluvium. Extensive moist forests of brown barrel *(Eucalyptus fastigata*), shining gum *(Eucalyptus nitens*), with soft tree-fern (*Dicksonia antarctica*) understorey. Dry forests of prickly stringybark *(Eucalyptus consideniana*) and silvertop ash *(Eucalyptus sieberi*). Temperate gully rainforest elements, wet heaths and upland swamps. Small areas of dwarf casuarina (*Allocasuarina nana*) heath on exposed sites.

Cul Cullarin Range Fault Block SEH Monaro

Prominent block faulted, steep sided, north-south range on the western edge of Lake George in Silurian and Ordovician sandstone, shale, acid volcanics and quartzite, elevation 700 to 830m. Shallow stony earths on upper slopes, stony dark grey to yellow texture-contrast soils on steep fans and debris slopes. Yellow box *(Eucalyptus melliodora*), grey box *(Eucalyptus microcarpa*), red stringybark *(Eucalyptus macrorhyncha*), scribbly gum *(Eucalyptus rossii*) and Blakely's red gum *(Eucalyptus blakelyi*) with diverse understorey of *Acacia* sp., and other shrubs on the hills.

Gtr Gourock - Tindery Ranges SEH Monaro

Higher parts of rocky ranges on Silurian-Devonian granites and granodiorite, standing above the more diffuse Gourock - Tindery Slopes Landscape, general elevation 1200 to 1800m. Thin stony brown loams and transitional alpine humus profiles. Red stringybark *(Eucalyptus macrorhyncha*), brittle gum (*Eucalyptus mannifera*), silvertop ash *(Eucalyptus sieberi*) at lower elevations. Alpine ash *(Eucalyptus delegatensis*), mountain gum *(Eucalyptus dalrympleana*), narrow-leaved peppermint *(Eucalyptus radiata*) with bitter pea (*Daviesia* sp.) and *Acacia* sp., understorey below the highest peaks, and sub-alpine complex of snow gum *(Eucalyptus pauciflora*) with common oxylobium (*Oxylobium ellipticum*), and yellow kunzea (*Kunzea ericifolia*) heaths on the highest peaks. Distinct mallee form communities of Dargo gum *(Eucalyptus perriniana*), Tingiringi gum *(Eucalyptus glaucescens*), narrow-leaved sallee

(Eucalyptus moorei) and narrow-leaved peppermint on the highest exposed peaks with patches of dwarf casuarina (*Allocasuarina nana*) and woolly tea-tree (*Leptospermum lanigerum*) heath.

Gts Gourock - Tindery Slopes SEH Monaro

Lower slopes, peaks and ridges of the Gourock - Tindery Ranges on Ordovician quartzose greywacke, quartzite, slate and hornfels, general elevation 900 to 1300m. Red and yellow texture-contrast soils common, relatively thin red profiles on ridges and deeper yellow profiles in valleys. Woodland of yellow box *(Eucalyptus melliodora*), Blakely's red gum *(Eucalyptus blakelyi*), with red box *(Eucalyptus polyanthemos*), apple box *(Eucalyptus bridgesiana*) and drooping she-oak (*Allocasuarina verticillata*) merging upslope to red stringybark *(Eucalyptus macrorhyncha*) and candlebark (*Eucalyptus rubida*) communities.

Ggp Gundary Plains SEH Monaro

Wide open valleys with abandoned terraces and Quaternary lakebeds on lower Devonian siltstone, sandstone, andesite and quartz felspar porphyry. General elevation 75m, local relief <30m. Yellow, hard setting texture-contrast soils with distinct bleached A2 horizons. Grasslands of spear grass (*Austrostipa* sp.) and kangaroo grass (*Themeda triandra*) with small clumps of sparse snow gum *(Eucalyptus pauciflora*) on rounded rocky hills and sandy lunettes of former lakes.

Jbv Jindabyne Plains SEH Monaro

Wide open valleys and plains at a general elevation of 800 to 900m with surrounding low ranges and rounded peaks to 1100m on massive Silurian-Devonian granite and granodiorite. Shallow gravelly loams on slopes, extensive red and yellow texture-contrast soils on slopes, two or three terraces marginal to the main streams with dark coloured gritty uniform loams and clays in alluvium. Dry tussock grassland of rough and variable spear grasses (*Austrostipa variabilis*) with kangaroo grass (*Themeda triandra*) on valley floors, patches of open snow gum *(Eucalyptus pauciflora*) and black sallee *(Eucalyptus stellulata*) woodland on hills, open forest of yellow box *(Eucalyptus melliodora*), Blakely's red gum *(Eucalyptus blakelyi*), with mixed understorey on moister ranges merging with adjacent landscapes.

Jiv Jingera Valley SEH Monaro

Open valley of the upper Queanbeyan River, on Silurian-Devonian granite and granodiorite, general elevation 900 to 1100m, local relief <100m. Gritty red and yellow texture-contrast soils becoming deeper and poorly drained down slope. Dark sandy clays in alluvium on floodplains and terraces. Open snow gum *(Eucalyptus pauciflora*), black sallee *(Eucalyptus stellulata*) woodlands fringe snow grass (*Poa* sp.) grasslands on the valley floor, merge up slope brown barrel *(Eucalyptus fastigata*) and manna gum (*Eucalyptus viminalis*) communities.

Kyt Kybeyan Montane SEH Monaro

Moderate to steep lower slopes of the Kybeyan Range landscape. Ridges of upper Devonian quartz sandstone, conglomerate, quartzite, siltstone and minor limestone on the Great Dividing Range. General elevation 800 to 1000m local relief to 200m. Well-developed dendritic drainage with strike control, red, red-yellow and yellow texture-contrast soils becoming deeper and more poorly drained down slope. Brown barrel *(Eucalyptus fastigata*), manna gum (*Eucalyptus viminalis*), with narrow-leaved peppermint *(Eucalyptus radiata*), broad-leaved peppermint *(Eucalyptus dives*), red stringybark *(Eucalyptus macrorhyncha*), messmate (*Eucalyptus obliqua*), silvertop ash *(Eucalyptus sieberi*) and mountain gum *(Eucalyptus dalrympleana*). Strong aspect control on plant associations, including fire patterns evident in dwarf casuarina (*Allocasuarina nana*), and woolly tea-tree (*Leptospermum lanigerum*) on shallow stony soils on exposed western slopes.

Kyb Kybeyan Range SEH Monaro

Highest parts of the Kybeyan Range ridges of upper Devonian quartz sandstone, conglomerate, quartzite, siltstone and minor limestone on the Great Dividing Range. General elevation 1000 to 1300m local relief to 250m. Stony outcrop along ridgelines, well developed dendritic drainage with strike control, stony brown to yellow texture-contrast soils becoming deeper and more poorly drained down slope. Snow gum *(Eucalyptus pauciflora*), with patches of Kybean mallee-ash *(Eucalyptus kybeanensis*) on high peaks. Mountain gum *(Eucalyptus dalrympleana*), alpine ash *(Eucalyptus delegatensis*), silvertop ash *(Eucalyptus sieberi*), narrow-leaved peppermint *(Eucalyptus radiata*) with diverse understorey of *Acacia* sp., and other shrubs in more protected sites. Dwarf casuarina (*Allocasuarina nana*) and woolly tea-tree (*Leptospermum lanigerum*) heath can extend into stony tops of exposed peaks.

Mir Minuma Range SEH Monaro

Strike ridge of upper Devonian quartz sandstone shale, conglomerate and limited beds of limestone (Bendethera and Big Hole) on the Great Dividing Range. General elevation 600 to 1250m, local relief to 500m. Stony outcrop along ridge lines, red, red-yellow and yellow texture-contrast soils becoming deeper and more poorly drained down slope. Brown barrel *(Eucalyptus fastigata*), manna gum (*Eucalyptus viminalis*) with narrow-leaved peppermint *(Eucalyptus radiata*), broad-leaved peppermint *(Eucalyptus dives*), red stringybark *(Eucalyptus macrorhyncha*), messmate (*Eucalyptus obliqua*), silvertop ash *(Eucalyptus sieberi*) and mountain gum *(Eucalyptus dalrympleana*). Strong aspect control on plant associations, including fire patterns evident in dwarf casuarina (*Allocasuarina nana*) heath on shallow stony soils on western slopes.

Msa Monaro Alluvium SEH Monaro

Small areas of Holocene alluvium on valley floors and terraces within the Monaro plains. General elevation about 700m, local relief <20m. Wet red-brown and grey massive gritty clays, with some soil carbonate and occasional layers of coarse sand and fine gravel. Treeless grasslands and swamps with species of adjacent landscapes, commonly with tall snow grass tussock (*Poa* sp.).

Mba Monaro Plains Basalts and Sands SEH Monaro

Extensive tablelands and rolling hills on Tertiary (Eocene) basalts with associated sub-basaltic sands and gravel of the pre-eruption land surface. General elevation 600 to 950m, local relief <100m. Exposed low rainfall (400-600mm) environment with high frost frequency. Relatively poorly developed dendritic drainage patterns. Heavy red-brown to black sticky uniform clay soils, extensive surface cracking when dry. Lighter textured red brown loams and occasional yellow-brown texture-contrast soils associated with exposed sands. Treeless grasslands of rough spear grass (*Austrostipa scabra*), variable spear grass (*Austrostipa variabilis*), tall spear grass (*Austrostipa nodosa*), kangaroo grass (*Themeda triandra*), tussocky snow grass (*Poa* sp.), and a high proportion of exotic grasses and herbs. Wet tussock with sedges and rushes on poorly drained flats, wallaby grass (*Austrodanthonia* sp.) at lower elevations.

Mbs Monaro Plains Meta-sediments SEH Monaro

Low block faulted ranges on Ordovician quartzite, phyllite, mudstone, slate and schist, general elevation 1000 to 1200m, 500 to 900mm rainfall. Shallow stony brown structured loam as uniform or gradational profiles. Snow gum *(Eucalyptus pauciflora*), black sallee *(Eucalyptus stellulata*) woodland on lower slopes in cold air pockets with wet tussock grasslands containing; kangaroo grass (*Themeda triandra*), tussocky snow grass (*Poa sieberiana*), and rigid fescue (*Catapodium rigidum*), and swamps with common rush (*Juncus usitatus*), round sedge (*Cyperus* sp.) on valley floors. Red stringybark *(Eucalyptus macrorhyncha*), brittle gum (*Eucalyptus mannifera*) on higher rocky slopes, merge to small areas of alpine ash *(Eucalyptus delegatensis*) and mountain gum (*Eucalyptus dalrympleana*) communities at higher elevations.

Shp Snowball High Valley **SEH Monaro**

Silurian-Devonian granite of the upper Shoalhaven valley and associated rounded hills. Rocky streambeds with gravel and coarse sand alluvium, upland swamps in black sandy clays in tributaries and deep red-brown gradational soils on deeply weathered granite. Includes small areas of meta-sediments. General elevation 750 to 1200m, local relief <150m. Open moist grasslands of snow grasses (*Poa* sp.) with fringing snow gum *(Eucalyptus pauciflora*) on valley floors, red stringybark *(Eucalyptus macrorhyncha*), manna gum (*Eucalyptus viminalis*) forests on slopes merging upward to stunted alpine ash *(Eucalyptus delegatensis*) and snow gum in cold air pockets and higher hilltops.

Vrr Varneys Range **SEH Monaro**

Block faulted range of Silurian-Devonian granite and granodiorite with steep slopes and abundant rounded tors in rocky outcrops. General elevation 900 to 1300m. Shallow, coarse sandy uniform profiles between rocks on crests, yellow-brown gritty texture-contrast profiles on slopes and to dull brown texture-contrast profiles on valley floors. Lower slopes of grasslands with open snow gum *(Eucalyptus_pauciflora*) and black sallee *(Eucalyptus stellulata*) along creeks. Upper slopes and crests of open woodland or low forest of red stringybark *(Eucalyptus macrorhyncha*) and brittle gum (*Eucalyptus mannifera*) communities.

Meso: SEH Monaro Granites

Bgb Bombala Granite Basin **SEH Monaro Granites**

Rounded and undulating hills on small stocks of Silurian-Devonian granite and granodiorite, general elevation 700 to 900m, local relief <100m. Gritty yellow texture-contrast soils with hard setting A horizons and harsh clays along drainage lines common. Wide valley originally with 'chain of ponds' stream form now gullied exposing dark gritty clays. Open grassy valleys with swampy patches surrounded by open woodlands of snow gum *(Eucalyptus pauciflora*) with grassy understorey on the slopes.

Brd Braidwood Granites **SEH Monaro Granites**

Rounded and undulating to moderately steep hills on Silurian-Devonian granite and granodiorite, general elevation 800 to 1100m, local relief 50 to 200. Gritty yellow texture-contrast soils with hard setting A horizons and harsh clays along drainage lines common. Wide valley originally with 'chain of ponds' stream form now gullied exposing dark gritty clays. Open grassy valleys with swampy patches surrounded by open woodlands of snow gum *(Eucalyptus pauciflora*) with grassy understorey on the slopes. Yellow box *(Eucalyptus melliodora*) and forest red gum *(Eucalyptus tereticornis*) at lower levels.

Byg Byadbo Ranges Granites **SEH Monaro Granites**

Low rounded ranges and small plateau on Silurian-Devonian granite and granodiorite, general elevation 800 to 1000m. Gritty uniform and yellow texture-contrast profiles on deeply weathered granite, sandy alluvium along streams. Open snow grass (*Poa* sp.) and spear grasses (*Austrostipa* sp.) along valley floors with fringing snow gum *(Eucalyptus pauciflora*), merging upslope to red stringybark *(Eucalyptus macrorhyncha*) and candlebark (*Eucalyptus rubida*) or brown barrel *(Eucalyptus fastigata*) and manna gum (*Eucalyptus viminalis*) communities depending on aspect.

Mbg Monaro Plains Granites **SEH Monaro Granites**

Rocky hills and steep valleys with abundant outcrop of Silurian gneiss, elevation 800 to 1100m. Thin gritty loams between rock outcrop extending to deeper red and red-yellow texture-contrast profiles on lower slopes. Black cypress pine (*Callitris endlicheri*) abundant in the rocks with red stringybark *(Eucalyptus macrorhyncha*), broad-leaved peppermint *(Eucalyptus dives*), manna gum *(Eucalyptus viminalis*) and red box *(Eucalyptus polyanthemos*).

Meso: SEH Murrumbateman

Bjr Burrinjuck Ridges SEH Murrumbateman
Ridges and low ranges on strongly folded Devonian rhyolite, dacite, sandstone, tuff and some limestones, streams aligned with strike directions on the eastern side then cut across the strike through the Burrinjuck Gorge, general elevation 400 to 970m, local relief 50 to 150m. Thin stony brown and red-brown sandy loam with limited development of red texture-contrast soils on some rock types. Black cypress pine (*Callitris endlicheri*), Blakely's red gum *(Eucalyptus blakelyi*), in the rocks with red stringybark *(Eucalyptus macrorhyncha*), broad-leaved peppermint *(Eucalyptus dives*), manna gum *(Eucalyptus viminalis*) and red box *(Eucalyptus polyanthemos*).

Dov Doura Volcanics SEH Murrumbateman
Rolling and undulating hills with occasional peaks on Silurian dacite, crystal tuff, sandstone and minor limestone, dendritic drainage pattern of ephemeral streams, general elevation 600 to 800m, local relief <100m. Red to red-yellow and yellow harsh gritty texture-contrast soils, gritty loams in alluvium with small areas of dark clays. Some evidence of salinity on lower slopes. Open woodland of Blakely's red gum *(Eucalyptus blakelyi*), yellow box *(Eucalyptus melliodora*), red stringybark *(Eucalyptus macrorhyncha*) with kangaroo grass (*Themeda triandra*), mixed river red gum *(Eucalyptus camaldulensis*) and river oak (*Casuarina cunninghamiana*) along permanent streams.

Mqc Molonglo Channels and Floodplains SEH Murrumbateman
Channel, floodplain, terraces and gorge tract of the Molonglo River upstream of the Canberra Plains landscape, general elevation 600 to 700m, local relief <50m. Quaternary alluvium and channels incised into steeply dipping Silurian shale, lithic tuff and dacite. Undifferentiated sand and loam along the stream, uniform loams on the floodplain, yellow texture-contrast soil on the terrace remnants and lower hill slopes. River oak (*Casuarina cunninghamiana*) along the banks, yellow box *(Eucalyptus melliodora*) and Blakely's red gum *(Eucalyptus blakelyi*) on the floodplain with grasses.

Mqn Molonglo Ranges SEH Murrumbateman
Low hills with a few rocky peaks on Silurian-Devonian granite and granodiorite with some Silurian quartz and lithic sandstone, general elevation 800 to 1350m, local relief to 350m. Mottled yellow and brown texture-contrast soils with strongly bleached topsoils. Dark organic loams and clay loams on valley floors. Saline patches present. Blakely's red gum *(Eucalyptus blakelyi*), yellow box *(Eucalyptus melliodora*), on lower slopes, red stringybark *(Eucalyptus macrorhyncha*), bundy *(Eucalyptus goniocalyx*) and brittle gum (*Eucalyptus manifera*) on ridges. Areas of apple box *(Eucalyptus bridgesiana*) and brittle gum. Limited swampy flats and valley floor grasslands.

Uma Upper Murrumbidgee Channels and Floodplains SEH Murrumbateman
Channel, wide floodplain, terraces and rare source bordering dunes of the Murrumbidgee and Molonglo Rivers in vicinity the Canberra Plains landscape, general elevation 600m. Sand and gravel on the streambed, uniform brown loam on the floodplain yellow texture-contrast soil on high terraces and sandy red earths on the dunes that can extend onto adjacent foot slopes. Grasslands of; spear grass (*Stipa* sp.), snow grass (*Poa* sp.) with kangaroo grass (*Themeda triandra*) on younger alluvium, open woodlands of; yellow box *(Eucalyptus melliodora*), Blakely's red gum *(Eucalyptus blakelyi*), red stringybark *(Eucalyptus macrorhyncha*), and black cypress pine (*Callitris endlicheri*) on terraces and dunes.

Umg Upper Murrumbidgee Gorge SEH Murrumbateman

Steep sided gorge tract of the Murrumbidgee River in the vicinity of Burrinjuck. Meander channel pattern incised into Devonian rhyolite, dacite, andesite, agglomerate, tuff and shale, general elevation 400 to 500m, local relief to 100m. Abundant rocky outcrop with thin stony sandy loam. Dense gallery forest of river oak (*Casuarina cunninghamiana*).

Yac Yass Channels and Floodplain SEH Murrumbateman
Narrow channel, floodplain and terraces of the Yass River General elevation 500 to 600m, local relief 30m. Quaternary alluvial sands and loam, red texture-contrast soil on terrace remnants. Mixed river red gum *(Eucalyptus camaldulensis*) and river oak (*Casuarina cunninghamiana*) along the banks, grasslands with scattered yellow box *(Eucalyptus melliodora*) on the floodplain and terraces.

Meso: SEH Murrumbateman Granites

Ghg Gunning Hills SEH Murrumbateman Granites
Linear ranges and rounded hills on lower Silurian gneissic and foliated granite, general elevation 500 to 750m, local relief generally less than 100m. Siliceous uniform sands, red earths and yellow texture-contrast soils. Woodland of Blakely's red gum *(Eucalyptus blakelyi*), yellow box *(Eucalyptus melliodora*), some apple box *(Eucalyptus bridgesiana*), red stringybark *(Eucalyptus macrorhyncha*), white box *(Eucalyptus albens*), broad-leaved peppermint *(Eucalyptus dives*) and brittle gum (*Eucalyptus mannifera*) on stony ridges. Small areas of Argyle apple *(Eucalyptus cinerea*) and black cypress pine (*Callitris endlicheri*).

Meso: SEH Northern Granites

Bgr Bathurst Granites SEH Northern Granites
Undulating to steep hills on Carboniferous granites and granodiorite. Tors and rock outcrop common on the margins of the pluton that is surrounded by a distinctive contact ridge with steep slopes, general elevation 650 to 1000m, local relief 250m. Shallow red earths or siliceous sands occur on ridges, gritty texture-contrast soils with yellow clay subsoils on the slopes with deep coarse sands along streamlines and dense black clays in small swamps. Woodland to open forest of; yellow box *(Eucalyptus melliodora*), broad-leaved peppermint *(Eucalyptus dives*), red stringybark *(Eucalyptus macrorhyncha*) and white box *(Eucalyptus albens*) on ridges and slopes, manna gum *(Eucalyptus viminalis*) and river oak (*Casuarina cunninghamiana*) in valleys. Patches of black cypress pine (*Callitris endlicheri*) in rocky outcrops, grasslands with patchy snow gum *(Eucalyptus pauciflora*) woodlands in cold air drainage hollows.

Byp Boyd Plateau Granites SEH Northern Granites
Plateau with extensive swamps, low hills and deeply dissected margin on Carboniferous granite. Contiguous with the Boyd Plateau Landscape. General elevation 1100 to 1400m, local relief <80m. Red friable earths and weakly developed red texture-contrast soils. Forests of; grey gum (*Euclayptus punctata*), Blaxland's stringybark *(Eucalyptus blaxlandii*) on lower areas, and brown barrel *(Eucalyptus fastigata*), mountain gum *(Eucalyptus dalrympleana*), narrow-leaved peppermint *(Eucalyptus radiata*) and manna gum (*Eucalyptus viminalis*) on higher areas. Swamps on headwaters above 1200m contain peat and peaty sand with a number of rare plant species in closed sedgeland dominated by *Carex* sp.*, Juncus* sp., and *Baeckea* sp., with a canopy of several tea-tree species (*Leptospermum* sp.), bottlebrush (*Callistemon* sp.) and *Hakea* sp. Patches of snow gum *(Eucalyptus pauciflora*) and mountain gum.

Obg Oberon - Kialla Granites SEH Northern Granites
Small stocks of Carboniferous granite with minor gabbro, diorite and porphyry General elevation 1100 to 1250m, local relief <100m. Tors common on crests, thin gritty red earths grade to deeper red texture-contrast soils on slopes becoming harsher along stream flats. Forest of; broad-leaved peppermint *(Eucalyptus dives*), mountain gum *(Eucalyptus*

dalrympleana), red stringybark *(Eucalyptus macrorhyncha*), narrow-leaved peppermint *(Eucalyptus radiata*) and brown barrel *(Eucalyptus fastigata*). Snow gum *(Eucalyptus pauciflora*) on exposed rocky hilltops.

Meso: SEH Oberon

Rop Rockley Plains SEH Oberon
Low rolling hills on plateau surface with Silurian and Ordovician slate, phyllites, felspathic sandstones and interbedded volcanics. General elevation over 1000m, relief to 150m. Red and yellow texture-contrast soils with often with prominent bleached A_2 horizons. Mixed eucalyptus forest and woodlands including peppermints *(Eucalyptus* sp.), stringybark *(Eucalyptus* sp.), candlebark *(Eucalyptus rubida*), brittle gum *(Eucalyptus mannifera*) and snow gum *(Eucalyptus pauciflora*). Cold air drainage hollows with grasslands and swamps.

Meso: SEH Oberon Basalts

Mdb Mount David Basalts SEH Oberon Basalts
Low rises and hills on Tertiary basalt flows. General elevation 950 to 1100m, local relief 50 to 80m. Red friable clay loams with gradational profiles merging down slope with red and yellow texture-contrast soils. Tall woodland and open forest of apple box *(Eucalyptus bridgesiana*), manna gum *(Eucalyptus viminalis*), broad-leaved peppermint *(Eucalyptus dives*) and red stringybark *(Eucalyptus macrorhyncha*).

Shh Shooters Hill SEH Oberon Basalts
Flat topped hillcrests with Tertiary basalt, general elevation 1250m, local relief <50m. Deep red to red-brown structured loams and clay loams, grading to black clays in swampy streamlines. Narrow-leaved peppermint *(Eucalyptus radiata*), mountain gum *(Eucalyptus dalrympleana*) and some snow gum *(Eucalyptus pauciflora*) on high areas. Apple box *(Eucalyptus bridgesiana*), yellow box *(Eucalyptus melliodora*), manna gum (*Eucalyptus viminalis*) and Blakely's red gum *(Eucalyptus blakelyi*) in the west.

Meso: SEH Orange

Cit Carcoar Intrusives SEH Orange
Low hills with steep slopes on small intrusions of Ordovician gabbro and diorite, general elevation about 750m, local relief 50 to 100m. Red friable gradational profiles of loam and light clay. Open forest of; mountain gum *(Eucalyptus dalrympleana*) and broad-leaved peppermint *(Eucalyptus dives*) on crests, with apple box *(Eucalyptus bridgesiana*), white box *(Eucalyptus albens*) and yellow box *(Eucalyptus melliodora*) on slopes and manna gum *(Eucalyptus viminalis*) along streams.

Mas Mandurama Slopes SEH Orange
Rolling hills and ranges on the south western margin of the central tablelands below the Canobolas Sheet Basalts landscape on a complex of Ordovician tuff, andesite, conglomerate, shales, lithic sandstone and mixed Silurian-Devonian granite and granodiorite. General elevation 700 to 900m, local relief <100m. Zone of rapid change in rainfall and temperature with a commensurate shift in vegetation from tablelands to western slopes. Texture-contrast soils throughout, red profiles on crests, red-brown and yellow on slopes, and yellow harsher profiles on valley floors. Open forests of; yellow box *(Eucalyptus melliodora*), white box *(Eucalyptus albens*) and red stringybark *(Eucalyptus macrorhyncha*) with manna gum *(Eucalyptus viminalis*) along streams in the higher parts. Grey box *(Eucalyptus microcarpa*), yellow box and some black cypress pine (*Callitris endlicheri*) with river oak (*Casuarina cunninghamiana*) along the streams in the lower parts.

Meso: SEH Ultramafics

Byn Byng Ultramafics SEH Ultramafics
Rolling hills and valleys on Ordovician basalts and mafic pyroclastics, general elevation 900 to 1000m, local relief <50m. Thin brown structured loam with rock outcrop on ridges, friable brown texture-contrast soils on slopes and deep brown to black cracking clays in swampy valley floors. Yellow box *(Eucalyptus melliodora*) woodland to open forest with; Blakely's red gum *(Eucalyptus blakelyi*), apple box *(Eucalyptus bridgesiana*), and broad-leaved peppermint *(Eucalyptus dives*), and manna gum *(Eucalyptus viminalis*) in valleys.

SEQ - Descriptions for Landscapes in the South East Queensland Bioregion

Meso: SEQ Clarence Basin

Bal Ballina Coastal Ramp SEQ Clarence Basin
Coastal ranges and low hills on early Jurassic sub-horizontal coarse felspathic sandstone, lithic sandstone, claystone and coal measures, general elevation 25 to 100m, local relief 50m. Yellow and brown texture-contrast soils on slopes and dark grey clays along valley floor streamlines. Dry hardwood forest of; spotted gum *(Corymbia maculata*), blackbutt *(Eucalyptus pilularis*), large-fruited blackbutt *(Eucalyptus pyrocarpa*), with grasses and burrawang (*Macrozamia* sp.). Limited areas of subtropical closed forest on higher quality soil and littoral closed forest on alluvium and sand dunes with tuckeroo (*Cupaniopsis anacardioides*), three-veined cryptocarpa (*Cryptocarya triplinervis*), hard corkwood (*Endiandra sieberi*) and coast banksia (*Banksia integrifolia*).

Byu Baryugil Ultramafics SEQ Clarence Basin
Low peaked hills adjacent to steep ridges with rock outcrop of Carboniferous serpentinised peridotite and pyroxenite ultrabasic rocks and some Permian/Triassic granodiorite. General elevation 100 to 500m, local relief 250m. Shallow stony brown loam with high metals content. Small areas of dry closed forest. Dry coastal hardwood forest with tall grass trees (*Xanthorrhoea* sp.), and local endemic *Eucalyptus ophitica.* Other rare species are likely.

Btp Byron - Tweed Alluvial Plains SEQ Clarence Basin
Channels, floodplain, terraces and estuary of the Tweed River and other coastal streams on Quaternary alluvium, general elevation 0 to 50m, local relief 15m. Uniform brown earths and structured brown clays on floodplains. Brown texture-contrast soil with high organic content on terrace remnants. Most of the valley is cleared but contained subtropical closed forest with; white booyong (*Argyrodendron trifoliolatum*), red cedar (*Toona australis*), and retains many rare species such as; heart-leaved bosistoa (*Bosistoa selwynii*), velvet laurel (*Endiandra hayesii*), red-fruited ebony (*Dios*py*ros mabacea*) and southern fontainea (*Fontainea australis*). Dry coastal hardwood forest on the terraces and slopes including; cabbage gum *(Eucalyptus amplifolia*), forest red gum *(Eucalyptus tereticornis*), broad-leaved apple (*Angophora subvelutina*), river oak (*Casuarina cunninghamiana*), silky oak (*Grevillea robusta*), rough-barked apple (*Angophora floribunda*), native teak (*Flindersia australis*), coastal grey box *(Eucalyptus bosistoana*), pink bloodwood (*Corymbia intermedia*), spotted gum *(Corymbia maculata*), grey ironbark *(Eucalyptus paniculata*), broad-leaved paperbark (*Melaleuca quinquenervia*), blackwood (*Acacia melanoxylon*) and black she-oak (*Casuarina litoralis*).

Gvj Clarence - Manning Basin Margin SEQ Clarence Basin

Low ranges and foothills on the western margin of the Clarence-Manning Basin Margin below the Great Escarpment on gently folded middle Jurassic felspathic and lithic clayey sandstones, general elevation 100 to 400m, local relief 150m. Yellow and brown texture-contrast soils on slopes, sandy alluvium and dark uniform clay or clay loams along valley floors. Moist hardwood forest of; blackbutt *(Eucalyptus pilularis*), grey gum *(Eucalyptus punctata*), white mahogany *(Eucalyptus acmenoides*), red mahogany *(Eucalyptus resinifera*) and some New England blackbutt *(Eucalyptus andrewsii* ssp. *campanulata*).

Crp Clarence - Richmond Alluvial Plains SEQ Clarence Basin

Wide valleys, channels, floodplains, terraces and estuaries of the Clarence and Richmond Rivers and other coastal streams on Quaternary alluvium, general elevation 0 to 50m, local relief 15m. Deep brown earths and structured brown clay on floodplains. Terrace with yellow texture-contrast soil containing ironstone concretions. Extensively cleared the valley floor supported forest of cabbage gum *(Eucalyptus amplifolia*), forest red gum *(Eucalyptus tereticornis*), broad-leaved apple (*Angophora subvelutina*), river oak (*Casuarina cunninghamiana*), silky oak (*Grevillea robusta*), rough-barked apple (*Angophora floribunda*), native teak (*Flindersia australis*), coastal grey box *(Eucalyptus bosistoana*), pink bloodwood (*Corymbia intermedia*), spotted gum *(Corymbia maculata*), grey ironbark *(Eucalyptus paniculata*), broad-leaved paperbark (*Melaleuca quinquenervia*), blackwood (*Acacia melanoxylon*) and black she-oak (*Casuarina litoralis*). On the margins of the basalt based Lamington Volcanic Slopes Landscape; dry closed forest with native cascarilla (*Croton verreauxii*), yellow tulip (*Drypetes deplanchei*), silver basswood (*Polyscias elegans*), guioa (*Guioa semiglauca*), red cedar (*Toona australis*) with abundant vines and emergent hoop pine (*Araucaria cunninghamii*). Salt marsh, mangrove communities and paperbark (*Melaluca quinquenervia*) freshwater swamps occur in the estuary.

Cfh Clarence Foothills SEQ Clarence Basin

Subdued ranges and hills on gently folded middle Jurassic claystone, lithic and felspathic sandstone, coal measures and quartz sandstone, general elevation 150 to 550m, local relief 250m. Yellow, brown and gleyed texture-contrast soils on slopes, sandy alluvium and dark uniform clay or clay loams along valley floors. Moist hardwood forest of; blackbutt *(Eucalyptus pilularis*), grey gum *(Eucalyptus punctata*), white mahogany *(Eucalyptus acmenoides*), red mahogany *(Eucalyptus resinifera*), New England blackbutt *(Eucalyptus andrewsii* ssp. *campanulata*), and Sydney blue gum *(Eucalyptus saligna*). Pockets of dry closed forest are present in gullies protected from fire.

Gwh Grafton - Whiporie Basin SEQ Clarence Basin

Extensive low undulating hills and large drainage basins on sub-horizontal upper Jurassic interbedded quartz sandstone, lithic sandstone, clayey siltstone and coal measures. Often exhibits ironstone concretions in the weathering profile. General elevation 50 to 150m, local relief 50m. Yellow and brown texture-contrast soils on slopes and dark grey clays along valley floor streamlines. Dry hardwood forest of; spotted gum *(Corymbia maculata*), blackbutt *(Eucalyptus pilularis*), large-fruited blackbutt *(Eucalyptus pyrocarpa*), with grasses and burrawang (*Macrozamia* sp.).

Rrr Richmond Range SEQ Clarence Basin

Part of the Great Dividing Range and dissected plateau on the western side of the Clarence-Moreton Basin on middle Jurassic quartz sandstone and conglomerate. General elevation 150 to 670m, local relief 250m. Red-brown and yellow texture-contrast soils on slopes and uniform clay loams along valleys with high organic content. Discrete blocks of subtropical closed forest of; white booyong (*Argyrodendron trifoliolatum*), red carabeen (*Geissois benthamii*), rose marara (*Pseudoweinmannia lanchnocarpa*), pigeonberry ash (*Cryptocarya erythroxylon*), myrtle ebony (*Dios*p*yros pentamera*), incense cedar (*Anthocarapa* sp.), teak (*Flindersia australis*), long jack (*Flindersia xanthoxyla*), white cedar (*Melia azedarach*), yellow carabeen (*Sloanea woollsii*) and emergent Moreton Bay fig (*Ficus macrophylla*),

strangling fig (*Ficus watkinsiana*), giant stinging tree (*Dendrocnide excelsa*) and hoop pine (*Araucaria cunninghamii*). Drier sites and less fertile soils support dry closed forest communities or hardwood forests of; Sydney blue gum *(Eucalyptus saligna*), tallow wood (*Eucalyptus microcorys*), turpentine (*Syncarpia glomulifera*), brush box (*Lophostemon confertus*) with subtropical closed forest species in the understorey.

Srr Summervale Range SEQ Clarence Basin
Higher inland coastal range adjacent to Ballina Coastal Ramp on prominent line of middle Jurassic quartz sandstone and conglomerate, with prominent water gaps where streams have cut across the structure. Strong structural control with north-south folds. General elevation 50 to 325m, local relief 150m. Shallow stony red-brown structured loams, and red, yellow or brown texture-contrast soils in different slope positions, the colour differing with drainage conditions. Dry hardwood forest of; spotted gum *(Corymbia maculata*), blackbutt *(Eucalyptus pilularis*), large-fruited blackbutt *(Eucalyptus pyrocarpa*), with grasses and burrawang (*Macrozamia* sp.).

Cla Upper Clarence Channels and Floodplains SEQ Clarence Basin
Channel, floodplain and terraces of the upper Clarence River and tributaries on Quaternary alluvium, general elevation 55 to 110m, local relief 20m. Alluvial earthy sand and structured brown clay on floodplains. Yellow texture-contrast soil on the terrace. Moist forest of; blackbutt *(Eucalyptus pilularis*), grey gum *(Eucalyptus punctata*), white mahogany *(Eucalyptus acmenoides*), forest red gum *(Eucalyptus tereticornis*), broad-leaved apple (*Angophora subvelutina*), river oak (*Casuarina cunninghamiana*), grey ironbark *(Eucalyptus paniculata*), broad-leaved paperbark (*Melaluca quinquenervia*), and blackwood (*Acacia melanoxylon*). Areas of dry closed forest in protected gullies with; yellow tulip (*Drypetes deplanchei*), brush box (*Lophostemon confertus*), mannawood (*Euroschinus falcata*), native olive (*Olea paniculata*), with emergent hoop pine (*Araucaria cunninghamii*).

Meso: SEQ Coastal Barriers

Bcb Byron - Tweed Coastal Barriers SEQ Coastal Barriers
Beaches, dunes, swamps and lagoons on Quaternary coastal sands, with inner and outer barrier dune sequences, general elevation 0 to 25m, local relief 10 to 20m. Essentially similar landscape pattern as the Clarence - Richmond Barriers and Beaches Landscape but with a greater proportion of swamp, shifts in common plant species and large areas of littoral closed forest of; tuckeroo (*Cupaniopsis anacardioides*), broad-leaved lilly pilly (*Acmena hemilampra*), plum pine (*Podocarpus elatus*), riberry (*Syzygium luehmannii*), yellow pear fruit (*Mischocarpus pyriformis*), yellow tulip (*Drypetes deplanchei*) with abundant vines and occasional epiphytes.

Clb Clarence - Richmond Barriers and Beaches SEQ Coastal Barriers Beaches, dunes, swamps and lagoons on Quaternary coastal sands, with inner and outer barrier dune sequences, general elevation 0 to 25m, local relief to 10m. Inland sequence of; siliceous sand on the beach with coast spinifex and coast casuarina on the berm. Siliceous sand with organic topsoil on the hind dune with; tuckeroo (*Cupaniopsis anacardioides*), coast wattle (*Acacia longifolia* ssp. *sophorae*), broad-leaved paperbark (*Melaluca quinquenervia*), and coastal screw palm (*Pandanus pedunculata*). Pleistocene high dunes with well developed podsol profile and hairpin banksia (*Banksia spinulosa*), wallum banksia (*Banksia aemula*), heath banksia (*Banksia ericifolia*), black tea-tree (*Melaleuca bracteata*), pink bloodwood (*Corymbia intermedia*), broad-leaved white mahogany *(Eucalyptus acmenoides*), grass tree (*Xanthorrhoea* sp.), kangaroo grass (*Themeda triandra*) and blady grass (*Imperata cylindrica*). Poorly drained inner low dunes and beach ridges, relief 1 to 2m, with humus podsols and peaty podsols with broad-leaved paperbark, wallum bottlebrush (*Callistemon pachyphyllus*), coast tea-tree (*Leptospermum laevigatum*), common reed (*Phragmites australis*), common rush (*Juncus usitatus*) and coral fern (*Gleichenia* sp.). Back barrier

swamps and plains with gradational dark coloured loamy sand, peaty podsol and acid peat with broad-leaved paperbark, swamp oak (*Casuarina glauca*), swamp mahogany *(Eucalyptus robusta*), forest red gum *(Eucalyptus tereticornis*), red bloodwood (*Corymbia gummifera*), pink bloodwood, coast banksia (*Banksia integrifolia*), and rough-barked apple (*Angophora floribunda*) on better drained sites. High dunes on the bedrock coastal ramp with shallow podsols and blackbutt *(Eucalyptus pilularis*), pink bloodwood, broad-leaved white mahogany, red bloodwood and brush cypress pine (*Callitris macleayana*).

Meso: SEQ Volcanics

Ftb Flat Top Basalts SEQ Volcanics

Peaks and flat-topped hills of Tertiary trachytic and basaltic volcanic plugs and flow remnants, general elevation 150 to 470m, local relief 180m. Thin stony structured red-brown lam and clay loam, friable, well drained and moderately fertile. Mainly closed forest species such as coachwood (*Ceratopetalum apetalum*) and sassafras (*Doryphora sassafras*) with emergent turpentine (*Syncarpia glomulifera*), tallow wood (*Eucalyptys microcorys*) and Sydney blue gum *(Eucalyptus saligna*).

Lav Lamington Volcanic Slopes SEQ Volcanics

Very extensive hills and ridges forming a broadly circular pattern 50km in diameter with radial drainage centred on Mt Warning. The Tertiary Lamington volcanics complex of multiple layers of flows of basalt, rhyolite and trachyte and pyroclastics including; tuff and agglomerate. General elevation 50 to 1120m, local relief varies considerably and is greatest in the higher landscape where it is up to 500m. Soils are mostly red and brown gradational structured loams with high organic content and high fertility. On lower slopes adjacent to valleys red, brown and grey-brown texture-contrast soils occur. Most of the landscape is covered in subtropical closed forest with stands of cool temperate Antarctic beech above 1000m.

Typical subtropical species include; white booyong (*Argyrodendron trifoliolatum*), red carabeen (*Geissois benthamii*), rose marara (*Pseudoweinmannia lanchnocarpa*), pigeonberry ash (*Cryptocarya erythroxylon*), myrtle ebony (*Dio*spy*ros pentamera*), incense cedar (*Anthocarapa* sp.) and emergent Moreton Bay fig (*Ficus macrophylla*), strangling fig (*Ficus watkinsiana*), giant stinging tree (*Dendrocnide excelsa*) and yellow carabeen (*Sloanea woollsii*). Drier sites and less fertile soils support forests of; Sydney blue gum *(Eucalyptus saligna*), brush box (*Lophostemon confertus*), broad-leaved apple (*Angophora subvelutina*), flooded gum *(Eucalyptus grandis*), turpentine (*Syncarpia glomulifera*), blackbutt *(Eucalyptus pilularis*) and coachwood (*Ceratopetalum apetalum*). On lower slopes; tallow wood (*Eucalyptys microcorys*) grey gum *(Eucalyptus punctata*), white mahogany *(Eucalyptus acmenoides*), manna gum (*Eucalyptus viminalis*) and forest oak (*Allocasuarina torulosa*).

Mwe Mount Warning Exhumed Slopes SEQ Volcanics

Moderately steep hills and ridges with central drainage to the Tweed River formed on the slopes of a pre-Tertiary landscape exposed by erosion of the Lamington volcanics. Silurian-Devonian greywacke, slate, phyllite and quartzite, Triassic rhyolite, tuff and claystone and Jurassic shale sandstone and coal. General elevation 25 to 300m, local relief 125m. Shallow structured and friable red and brown loam and clay loam gradational profiles. Subtropical and tropical closed forest of; white booyong (*Argyrodendron trifoliolatum*), native teak (*Flindersia australis*), pigeonberry ash (*Cryptocarya erythroxylon*), ball nut (*Floydia praealta*), ferny-leaf bosistoa (*Bosistoa pentacocca*), union nut (*Bouchardatia neurococca*), doughwood (*Melicope octandra*), crow's ash (*Pentaceras australis*), red lilly pilly (*Syzygium hodgkinsoniae*) and numerous vines. Marginal areas of; tallow wood (*Eucalyptus microcorys*), Sydney blue gum *(Eucalyptus saligna*), red bloodwood (*Corymbia gummifera*),

turpentine (*Syncarpia glomulifera*), brush box (*Lophostemon confertus*) and blackwood (*Acacia melanoxylon*).

Mtw Mount Warning Plugs SEQ Volcanics

High, steep peak of the central plug of the Tertiary Mt Warning/Lamington volcanic complex of; basalt, trachyte, gabbro, syenite and rhyolite. Radial drainage of the central peak and a prominent cliff line around the plug in columnar jointed rhyolite. General elevation 300 to 1160m, local relief 750m. Considerable rock outcrop and thin stony brown loam. Deeper organic rich structured loam in the rubbly debris slope with subtropical closed forest of; white booyong (*Argyrodendron trifoliolatum*), red carabeen (*Geissois benthamii*), yellow carabeen (*Sloanea woollsii*), red cedar (*Toona australis*), bangalow palms (*Archontophoenix cunninghamiana*), giant stinging tree (*Dendrocnide excelsa*), flame tree (*Brachychiton acerifolius*) and *Ficus* sp. on the rocky cliff face.

Nrr Nimbin Ridges SEQ Volcanics

Steep ridges, and prominent 100m cliff line with sub-parallel incised valleys on layered basalt, rhyolite flows with strong columnar jointing and related pyroclastics. Slopes rise in a northerly direction toward Mt Warning. General elevation 100 to 930m, local relief 400m. Bouldery debris slopes below the cliff with gradational red-brown gritty loam, structured friable red clay on basalts and some brown texture-contrast soils. Upper edge of the cliff with dwarf scrub of; red bloodwood (*Corymbia gummifera*), forest oak (*Allocasuarina torulosa*) and scribbly gum *(Eucalyptus signata*). Below the cliffs; moist hardwood forest with blackbutt *(Eucalyptus pilularis*) and brush box (*Lophostemon confertus*) with a closed forest understorey and in the valleys subtropical closed forest of; white booyong (*Argyrodendron trifoliolatum*), red carabeen (*Geissois benthamii*), yellow carabeen (*Sloanea woollsii*), red cedar (*Toona australis*), scentless rosewood (*Synoum glandulosum*), white beech (*Gmelina leichhardtii*), and bangalow palms (*Archontophoenix cunninghamiana*).

Wsp Woodenbong Syenite Plugs SEQ Volcanics

Isolated conical and rounded peaks with surrounding debris slopes on Tertiary syenite plugs, general elevation 500 to 1000m, local relief 350m. Bouldery debris slopes below the peaks with gradational red-brown gritty loam and structured friable red clay. Mixed subtropical and warm-temperate closed forest with; white booyong (*Argyrodendron trifoliolatum*), yellow carabeen (*Sloanea woollsii*), red cedar (*Toona australis*), bangalow palms (*Archontophoenix cunninghamiana*), plum pine (*Podocarpus elatus*), crab apple (*Schizomeria ovata*), soft corkwood (*Duboisia myoporoides*), prickly ash (*Orites excelsa*), blue lilly pilly (*Syzygium oleosum*), hoop pine (*Araucaria cunninghamii*), coachwood (*Ceratopetalum apetalum*), sassafras (*Doryphora sassafras*), soft tree-fern (*Dicksonia antarctica*), hard tree-fern (*Cyathea australis*) and prickly tree tree-fern (*Cyathea leichardtiana*). In drier sites and on poorer soils; New England blackbutt (*Eucalyptus andrewsii* ssp. *campanulata*), red bloodwood (*Corymbia gummifera*) and tallow wood (*Eucalyptus microcorys*).

SSD - Descriptions for Landscapes in the Simpson Strzelecki Bioregion

Meso: SSD Sturt

Sud Sturt Dunes SSD Sturt

Sturt Dunes landscape is made up of part of the *Marrapina* land system.

Partly aligned low dunes of Quaternary age, relief to 6m. Deep red clayey sand, with narrow flat swales of sandy red earths overlying earthy pans. Dense white cypress pine (*Callitris glaucophylla*) with sparse mulga (*Acacia aneura*) on dunes, canegrass (*Eragrostis australasica*) in swales.

Sul Sturt Linear Dunes SSD Sturt

Sturt Linear Dunes landscape includes parts of three land systems: *Binerah, Corner* and *Gumpopla*

Parallel and widely spaced high dunes of Quaternary age, relief to 10m. Deep red earthy sand, interspersed with alluvial corridors and claypans draining from the adjacent tablelands and ranges. Alluvial flats of sandy red earths and texture-contrast soils with calcareous subsoils or earthy pans exposed in scalds.

Isolated fuchsia bush (*Eremophila* sp.) abundant grasses and forbs with canegrass (*Eragrostis australasica*) in small brown and grey cracking clay pans. Bare scalded alluvial flats with sandy red earths and texture-contrast soils and open mulga (*Acacia aneura*) and shrubs. Unstable dune crests of deep, loose sand; isolated grevilleas with rattlepod (*Crotalaria* sp.), white fox tail (*Ptilotis latifolius*) and sparse forbs. Mulga, needlewood (*Hakea leucoptera*), sandhill wattle (*Acacia ligulata*), white cypress pine (*Callitris glaucophylla*), clumps of spinifex (*Triodia* sp.), and grasses on dunes and swales. Isolated small pans of grey and brown cracking clay with canegrass, some lignum (*Muehlenbeckia cunninghamii*), black bluebush (*Maireana pyramidata*) and fringing broombush (*Melaleuca* sp.) and black box *(Eucalyptus largiflorens*).