

## Regional ecosystems: Open forest & woodland



### RE 12.3.11

## Queensland Blue Gum +/- Queensland Grey Ironbark and Pink Bloodwood open forest on alluvial plains usually near the coast

The coastal lowlands of SEQ support many different types of vegetation, much of which is dense or swampy due to the high rainfall, terrain and soils. Regional Ecosystem (RE) 12.3.11 is found among Coastal Paperbark (*Melaleuca quinquenervia*) forests, gallery rainforests, tall wet sclerophyll forests, shrubby open forests, heathlands and swamps where it forms patches of comparatively open country along many of the rivers and creeks.

This ecosystem contains a mix of tall and medium-sized trees. The main canopy species are Queensland Blue Gum (*Eucalyptus tereticornis*), Queensland Grey Ironbark (*Eucalyptus siderophloia*) and Pink Bloodwood (*Corymbia intermedia*).

Other species may be present locally, for example Moreton Bay Ash (*Corymbia tessellaris*) and Narrow-leaved Red Gum (*Eucalyptus seeana*). Swamp Mahogany (*Lophostemon suaveolens*) and Coastal Paperbark frequently form a patchy lower tree layer, and the ground stratum is relatively open and grassy.

The mix of trees in RE 12.3.11 includes several important Koala food species and the ecosystem provides high quality habitat for this iconic species.



**RE 12.3.11 is typically an open woodland with a diverse assortment of groundlayer plants and occasional shrubs, young canopy trees and some vines or scramblers. The relative abundance of Coastal Paperbark (*Melaleuca quinquenervia*) will increase as the soils become more prone to waterlogging and can eventually transition into a different ecosystem dominated by Coastal Paperbark in the lower parts of flat landscapes.**

Regional Ecosystems, or REs for short, are used in Queensland to describe native vegetation types based on where they grow, the plant species in the tallest layer and the underlying geology. There are about 150 different REs in SEQ, all of which have a unique three-part number usually starting with '12'.

For more information on REs visit [www.qld.gov.au/environment/plants-animals/plants/ecosystems](http://www.qld.gov.au/environment/plants-animals/plants/ecosystems)



## Distribution

RE 12.3.11 grows on floodplains of coastal streams in the higher rainfall eastern parts of SEQ, and along the Stanley River a westward-flowing tributary of the Brisbane River. The soils supporting RE 12.3.11 include loams and loamy/sandy clays that are prone to waterlogging.

**The sandy loam soils of RE 12.3.11 are periodically waterlogged, being located in lower parts of the landscape and in high rainfall areas of the region.**

## Variations and similarities

Some variation in species composition occurs within RE 12.3.11 reflecting the position in the catchment, soils and drainage. For example, the narrow floodplains in the upper parts of catchments often have soils that are derived from a relatively uniform geology, whereas the soils further downstream are more inter-mixed with material derived from a range of different rock types.

Coastal Paperbark, Narrow-leaved Red Gum, Rusty Gum (*Angophora leiocarpa*), Scribbly Gum (*Eucalyptus racemosa* subsp. *racemosa*), Black She-oak (*Allocasuarina littoralis*) and Coast Banksia (*Banksia integrifolia*) are characteristic of alluvial soils derived from sandstone and/or granite.

Drainage also influences the species composition of 12.3.11 with Coastal Paperbark, Swamp Mahogany, Snow-in-Summer (*Melaleuca linariifolia*) and Small-leaved Paperbark (*Melaleuca sieberi*) indicative of soils subject to waterlogging.

RE 12.3.11 transitions into RE 12.3.3 Queensland Blue Gum woodlands on broad floodplain systems and in drier inland parts.

The one sub-type of RE 12.3.11 is:

- **RE 12.3.11a** is described as open forest of Queensland Blue Gum and/or Queensland Grey Ironbark with a vine forest understorey. Other canopy species include Pink Bloodwood and Hoop Pine (*Araucaria cunninghamii*). Frequently occurring understorey species include *Flindersia* spp., Swamp Mahogany, Brush Box (*Lophostemon confertus*), Small-leaved Tuckeroo (*Cupaniopsis parvifolia*), *Acronychia* spp., Red Ash (*Alphitonia excelsa*) and Hickory Wattle (*Acacia disparrima* subsp. *disparrima*). RE 12.3.11a has a highly restricted distribution in SEQ.



**Black She-oak can thicken and modify RE 12.3.11 in the absence of fire.**



**The understorey of RE 12.3.11a consists of vine forest species, usually associated with drainage lines or depressions in the broader landscape. RE 12.3.11a is quite rare in SEQ.**

## Distribution map 12.3.11

Much of the Queensland Blue Gum – Grey Ironbark – Pink Bloodwood open forest in SEQ has been lost to urban and peri-urban land uses. Its former distribution was closely aligned to the floodplain and tributary systems and estuaries of coastal rivers (eg. Logan, Brisbane, Caboolture). With increasing urbanisation on the coastal plains of SEQ, many of the surviving patches of RE 12.3.11 are confined to the upper reaches of streams. RE 12.3.11 is considered an 'of concern' ecosystem under Queensland legislation.

### 1. Lake Flat Road, Boreen Point

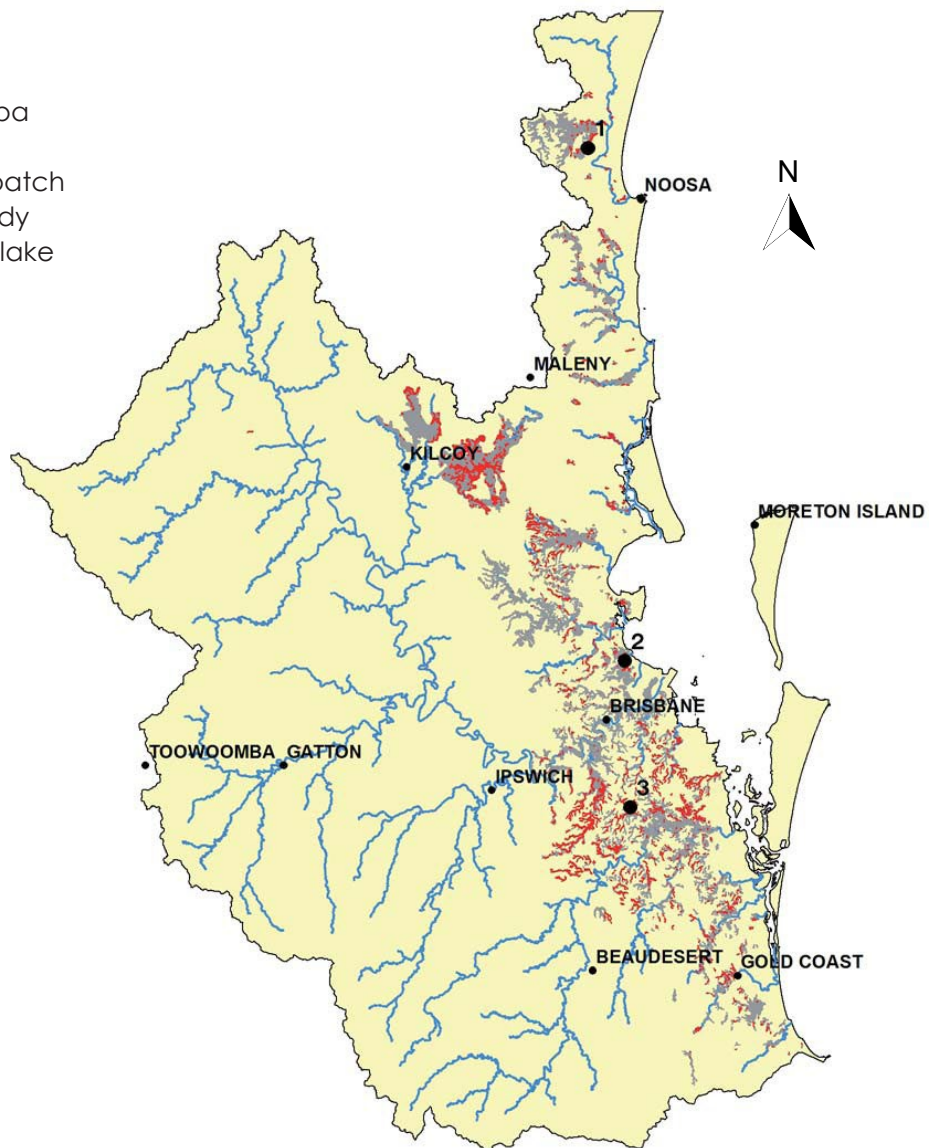
Between shoreline of Lake Cootharaba and Lake Flat Road contains a good example of RE 12.3.11. This remnant patch continues north to link into Great Sandy National Park to the north, along the lake shore.

### 2. Boondall Wetlands

The north western corner of this reserve, including the retained bushland around the Brisbane Entertainment Centre is predominately RE 12.3.11, and easily viewed from the maintained tracks and fire trails.

### 3. Karawatha Bushland Reserve

The south western corner of this reserve (accessed off Illaweena Street) contains a patch of RE 12.3.11 approximating the wetland areas. Access to the patch can be achieved along the Wild May Lagoon Trail.



■ Pre-clearing (~180 years ago)

■ Today's distribution

\*Map is indicative only - Due to scale, some RE occurrences may not be visible.

**Vegetation Management Act (1999) status: Of Concern**  
**Level of Protection (extent in protected areas): Low**

	Pre-clearing extent, or estimated amount ~180 years ago (hectares)	Current extent (hectares)	Percent of pre-clearing extent remaining	Amount protected in reserves (hectares)
<b>12.3.11</b>	<b>188,939</b>	<b>46,952</b>	<b>25%</b>	<b>16</b>
<b>12.3.11a</b>	<b>467</b>	<b>178</b>	<b>38%</b>	<b>18</b>



**Population growth on the coastal plains of the SEQ region has resulted in many patches of RE 12.3.11 being cleared or modified to make way for urban expansion.**

## Past to present

According to the accounts of early European explorers of SEQ, the flats associated with larger creeks and rivers were often relatively open and grassy especially in areas away from the coastal fringe. However, in places, the floodplain country was described as having a dense cover of trees.

The vegetation that comprises RE 12.3.11 is consistent with the observations of patches of relatively tall dense forests growing on alluvial flats particularly where shelter (e.g. smaller creek flats nestled in valleys) or reasonably high rainfall provide moist growing conditions for much of the time.

The conditions on the ground, whilst fairly shaded, appear to have remained sufficiently open to promote the growth of forest-type grasses especially Kangaroo Grass (*Themeda triandra*), Blady Grass (*Imperata cylindrica*) Cockatoo Grass (*Cymbopogon refractus*), Forest Blue Grass (*Bothriochloa bladhii*) and Scented Top (*Capillipedium spicigerum*). However, the growing conditions proved ideal for the introduced species Lantana (*Lantana camara*) that became widely established.

The tall straight trees growing in RE 12.3.11 have been a major source of construction timbers through time. There are few patches left that have not been subject to some form of activity that has removed or cleared trees and restricted natural regeneration.

In SEQ, population growth and urban expansion have compounded the effects of earlier timber harvest, with large tracts of RE 12.3.11 cleared or modified for houses and infrastructure. Consequently, remaining patches are largely confined to small valleys in the upper catchments of coastal streams.



**Many examples of RE 12.3.11 that remain on the coastal plains are subject to urban expansion and its impacts. This can include removal of the understorey for parkland conversion or garden dumpings along the edges of patches, which can introduce weeds such as Mother in Law's Tongue (*Sansevieria trifasciata*) shown above.**



**Small-leaved Paperbark (*Melaleuca sieberi*) is a species with very localised distributions in SEQ, occurring in moist to wet soils on the coastal plains, often in association with RE 12.3.11.**

The proximity of RE 12.3.11 to seasonal or permanent water is another factor contributing to faunal diversity as it provides habitat for frogs including threatened species such as the Green-thighed Frog (*Litoria brevipalmata*) and waterbirds.

The open nature of the ecological community enables ease of movement for larger mobile species, especially the Koala. Large mature trees develop hollows that provide important nesting and roosting sites for a range of birds and arboreal mammals.



## Natural values and functions

RE 12.3.11 is a biologically productive ecosystem. Perennial grasses and deep-rooted trees play a prominent role in intercepting, storing and recycling nutrients, protecting soil from erosion, reducing stream sediment loads during high intensity rainfall events and regulating ground water.

The vegetation provides food and shelter for a wide range of animals including Eastern Grey Kangaroos, wallabies, gliders, Koalas, bandicoots, birds, flying foxes, bats, native rats and mice, reptiles and many invertebrates.

## Management

Stands of RE 12.3.11 usually have a range of different size classes of each tree species present. Tree regeneration occurs in patches that arise from the death of individuals due to old-age, attack by pathogens or damage by wind, storms, floods and fire. Young trees regenerate from seed when suitable conditions arise, for example, following burning which exposes a bare mineral soil.

Eucalypts, Corymbias and Melaleucas store seed for a period in capsules carried high in the tree crown and the heat from a fire can trigger its release. Most seedlings do not survive long due to moisture stress and competition from other plants. The surviving seedlings of the majority of the tree species present in RE 12.3.11 develop lignotubers 18-36 months after germination.

**Infrequent or cool fires will allow species such as this Tuckeroo (*Cupaniopsis anacardioides*) to establish, which may over time form the beginnings of a vine forest understorey, and the ecosystem subtype RE 12.3.11a (right).**



The lignotuber is a woody swelling in the roots that contains food reserves and buds which enable plants to reshoot following damage from low intensity fire and browsing. This gives the young trees the capacity to survive and 'sit and wait' for an opportunity to grow when a canopy gap is formed that will reduce competition and increase the availability of sunlight and other resources vital for plant growth.

The grassy understorey of RE 12.3.11 is maintained by occasional fire. The fire guidelines for the RE recommend inter-fire intervals of 3-6 years. Burning carried out in cooler or moister periods encourages mosaics which help to retain ground litter and fallen timber habitat. Fire intervals in excess of the recommended interval favour fire-tolerant species, for example the native Blady Grass (*Imperata cylindrica*), as well as weedy forbs which increase in abundance at the expense of less fire-tolerant species. Conversely, longer fire intervals can result in a gradual increase in abundance of woody species such as some wattles. It is thought that long periods without fire have contributed to the formation of the dense vine forest type understorey present in subtype RE 12.3.11a.



Fire exclusion can also benefit invasive environmental weeds, particularly woody species. RE 12.3.11 is prone to invasion by a number of environmental weeds that have a capacity to alter the species composition of the ecosystem through time. The high-risk species include Groundsel Bush (*Baccharis halimifolia*), Slash Pine (*Pinus elliotii*), Lantana (*Lantana camara*) and Camphor Laurel (*Cinnamomum camphora*).

**The plants that comprise RE 12.3.11 can be greatly influenced by fire frequency and intensity. Frequent or hot fires will favour tolerant species such as Blady Grass (*Imperata cylindrica*) dominating the ground layer (left).**

Many other weeds have the potential to invade patches that are close to urban settlement especially if the ecosystem has not been burnt for a long time. For example, Chinese Elm (*Ulmus parvifolia*), Yellow Oleander (*Thevetia peruviana*) and Broad-leaved Pepper Tree (*Schinus terebinthifolius*) are such weeds.

Exotic grasses including Setaria or Pigeon Grass (*Setaria sphacelata*), Molasses Grass (*Melinis minutiflora*) and Green Panic (*Megathyrsus maximus*) can be a problem along edges and will move into adjacent bushland areas, especially after fire. The seeding period and regeneration characteristics of weeds may need to be taken into account in fire management to avoid increasing their spread and dominance.

## Restoration and regeneration

The key objective of restoring RE 12.3.11 is to establish a tree overstorey of mixed composition and a ground layer in which a broad range of native species are present and where there is a low abundance of weeds. Encouraging natural regeneration is preferable to replanting, as less effort will be required and plants are adapted to local conditions.

The capacity of an area to regenerate will be influenced by a number of factors including presence of natural regeneration, extent of weeds, proximity to similar vegetation and habitat that can allow plants and animals to move into the regenerating patch through time and the potential to manage fire and other agents of disturbance.

Trees with lignotubers often survive in paddocks that are grazed or periodically slashed. These will grow quickly after the disturbance stops. Regenerating trees require a period of several years free from fire and grazing.

Where some large seed trees remain present but there are no young trees, fire or mechanical disturbance to provide a bare, mineral soil can be trialled to germinate seedlings. Ploughing or ripping may also be beneficial at sites where soils have become compacted or where mat-forming grasses (e.g. Couch Grass, *Cynodon dactylon*) dominate.

Tree planting will be required where there are no longer any surviving seed trees or where there is an absence of lignotuberous saplings. In these situations, plants should be sourced from local populations and species chosen to reflect the local variation in soils and drainage.



**Two common weeds that can thrive in the moist soils of RE 12.3.11 are Billy Goat Weed (*Ageratum houstonianum*) (left) and Setaria (*Setaria sphacelata*) (right).**

Mechanised techniques for re-establishing native ground layer species, especially grasses, are not widely applied in SEQ. However, seedlings of Kangaroo Grass and other common species are available commercially. Species can also be re-introduced by mulching bare soil with seed heads of grasses harvested from a nearby patch of RE 12.3.11.

The density of shrubs should reflect local conditions – an open understorey will often be the norm but denser patches may occur locally especially where clump-forming species (e.g. Coastal Paperbark and Snow-in-Summer, *Melaleuca linariifolia*) are present. Many of the shrubs and small trees that occur naturally within RE 12.3.11 such as wattles and Red Ash (*Alphitonia excelsa*) are likely to regenerate naturally from seed stored in the soil.



**Small roadside remnants may be a good reference point to help guide restoration projects and help ensure species composition is representative of the local populations.**

Many native grasses and forbs are relatively resilient and continue to survive in heavily grazed or weedy pasture albeit in low densities. A thorough check of the ground layer during good growing conditions will provide an indication of the relative abundance of weeds and natives.

Herbaceous weeds (eg. Thistles - *Cirsium* spp., Fleabanes - *Conyza* spp.) and many introduced grasses tend to decline through time after disturbance is removed and the cover of native species increases.

## Restoration tips

- Plan the project in detail, as some of activities that may be required, such as weed control, can be labour intensive and require ongoing attention.
- Observe the mix of species that are present when growing conditions are good, keeping an eye out for perennial grasses and forbs. The ground layer is often more diverse than you think and some of those weedy looking plants may be beneficial natives.
- If restoring a degraded patch of forest that still has some remaining canopy trees, be prepared to experiment to see how small patches of regeneration can be successfully established.
- Don't use burning when the regenerating trees are young as they will be damaged or killed.
- Use local seed to protect the genetic resources of local wild populations of plants by reducing the risk of cross pollination with planted species sourced from outside the local area. The same applies to plants likely to disperse into adjacent remnants especially species that did not occur naturally in the local area. If re-introducing species that have become locally extinct try to secure seeds from the closest comparable populations.
- Let others know about your project, especially the successes. This will add to the pool of information to guide projects in the future.

## Some native plants of RE 12.3.11

### Trees and shrubs

Black Wattle	<i>Acacia concurrens</i>
Blackwood	<i>Acacia melanoxylon</i>
Black She-oak	<i>Allocasuarina littoralis</i>
Blue Gum	<i>Eucalyptus tereticornis</i>
Brisbane Wattle	<i>Acacia fimbriata</i>
Brush Box	<i>Lophostemon confertus</i>
Cheese Tree	<i>Glochidion ferdinandi</i>
Coast Banksia	<i>Banksia integrifolia</i>
Coffee Bush	<i>Breynia oblongifolia</i>
Early-flowering Black Wattle	<i>Acacia leiocalyx</i> subsp. <i>leiocalyx</i>
Flooded Gum	<i>Eucalyptus grandis</i>
Hickory Wattle	<i>Acacia disparrima</i> subsp. <i>disparrima</i>
Narrow-leaved Red Gum	<i>Eucalyptus seeana</i>

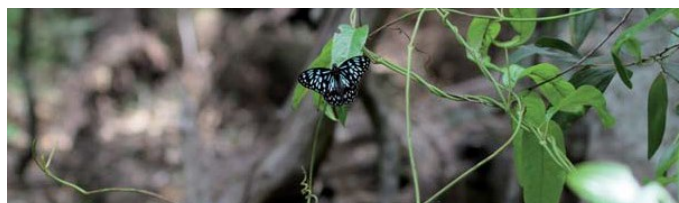
Paper-barked Tea-tree	<i>Melaleuca quinquenervia</i>
Pink Bloodwood	<i>Corymbia intermedia</i>
Pointed-leaf Hovea	<i>Hovea acutifolia</i>
Queensland Grey Ironbark	<i>Eucalyptus siderophloia</i>
Red Ash	<i>Alphitonia excelsa</i>
Rusty Gum	<i>Angophora leiocarpa</i>
Scribbly Gum	<i>Eucalyptus racemosa</i> subsp. <i>racemosa</i>
Small-leaved Paperbark	<i>Melaleuca sieberi</i>
Snow-in-Summer	<i>Melaleuca linariifolia</i>
Swamp Mahogany	<i>Lophostemon suaveolens</i>
Tallowwood	<i>Eucalyptus microcorys</i>
Wild May	<i>Leptospermum polygalifolium</i>



## Grasses, forbs, ferns and epiphytes

Barbed Wire Grass	<i>Cymbopogon refractus</i>
Blady Grass	<i>Imperata cylindrica</i>
Blue Trumpet	<i>Brunoniella australis</i>
Bracken Fern	<i>Pteridium esculentum</i>
Cockatoo Grass	<i>Alloteropsis semialata</i>
Common Fringe Sedge	<i>Fimbristylis dichotoma</i>
Cow Grass	<i>Paspalum scrobiculatum</i>
Flax Lily	<i>Dianella caerulea</i>
Forest Hopbush	<i>Dodonaea triquetra</i>
Hairy Panic	<i>Panicum effusum</i>
Hairy Trefoil	<i>Desmodium rhytidophyllum</i>
Kangaroo Grass	<i>Themeda triandra</i>
Matrush	<i>Lomandra longifolia</i>
Fringed Lily	<i>Murdannia graminea</i>
Ottochloa	<i>Ottochloa gracillima</i>
Poverty Grass	<i>Eremochloa bimaculata</i>
Scented Top	<i>Capillipedium spicigerum</i>

Small-flowered Finger	<i>Digitaria parviflora</i>
Spreading Panic Grass	<i>Paspalidium distans</i>
Twining Glycine	<i>Glycine clandestina, G. tabacina</i>
Twining Guinea Flower	<i>Hibbertia scandens</i>
Vernonia	<i>Cyanthillium cinereum</i>
Weeping Grass	<i>Microleana stipoides</i>
White Root	<i>Lobelia purpurascens</i>
Wiry Panic	<i>Entolasia stricta, Entolasia whiteana</i>



**Monkey Rope (*Parsonsia straminea*) with a Blue Tiger butterfly.**

## Vines and scramblers

Monkey Rope	<i>Parsonsia straminea</i>
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Designed and produced Healthy Land & Water, a community based, not-for-profit organisation that works to protect and restore the natural resources of South East Queensland.

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Information provided in the *Regional Ecosystems of South East Queensland* series provide a general guide and should not be taken to replace professional advice or a formal recommendation of land management.

### Further Reading

SEQ Healthy Land & Water Ecological Restoration Framework - [www.hlw.org.au](http://www.hlw.org.au)

SEQ Land for Wildlife Notes - [www.lfwseq.org.au](http://www.lfwseq.org.au)

Queensland Government - [www.qld.gov.au](http://www.qld.gov.au) (search Regional Ecosystems and Planned Burn Guidelines)



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