

## 2.2 Coastal tree swamp (floodplain and non-floodplain): *Melaleuca* spp. and *Eucalyptus* spp.

### Description

- Temporarily inundated with fresh water for three to six months of the year.
- Heavily to sparsely wooded, dominated by melaleucas, eucalypts or other water-tolerant tree species.
- Native pastures are generally sparse, except in more open tree swamps of the seasonal dry tropics.
- Often associated with other coastal wetland types, such as estuarine wetlands and grass, sedge and herb swamps.

#### Grazing value:



Moderate grazing value

#### Wetland values and ecosystem services:



Water security



Food



Flood mitigation



Water quality



Stabilising soil



Social and cultural



Carbon storage



Integrated pest management



Habitat



Figure 51 Coastal tree swamp near Townsville

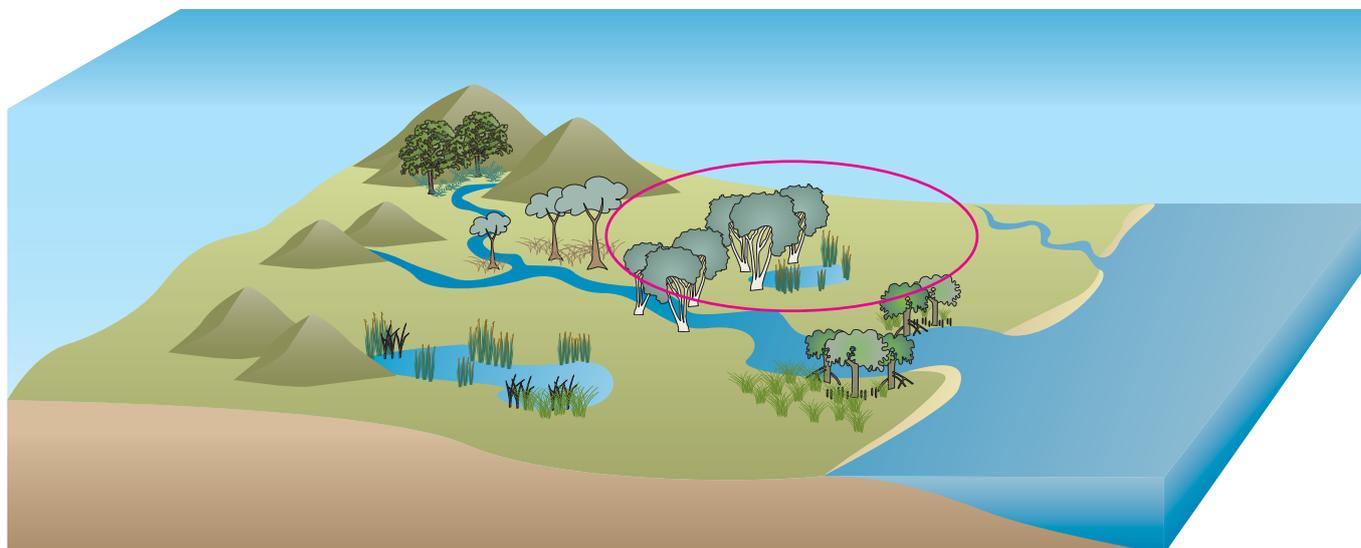


Figure 52 Coastal tree swamp in the landscape

**Landform**

Depressions on flat, broad floodplains, in the swales between coastal dunes, in the back levees of stream channels or on the inland side of saline wetlands.

**Vegetation description**

These wetlands are dominated by tea-trees *Melaleuca* spp. with an understorey of grasses, sedges, ferns, herbs and aquatic plants.

**Native pastures**

*Ischaemum* spp., swamp rice grass, blady grass, black and giant speargrass, saltwater/marine couch and kangaroo grass.

**Suitable sown pastures**

It is not recommended that pasture species be sown in these wetlands.

**Exotic pasture grasses and weeds**

Olive hymenachne, paragrass, aleman grass, pond apple, groundsel bush, rubbervine, lantana, papyrus, devil’s fig and water hyacinth.

**Soil**

A broad range of soil types depending on the position in the landscape, from silty to loamy clays, siliceous sands to poorly oxygenated marine clays. Soil originally from estuarine, stream or floodplain deposits. Main soil types include hydrosols, vertosols, sodosols, organosols and chromosols.

Surface soils are hard-setting and underlying soil may be Potential Acid Sulfate Soil (PASS) as peat, sand or mud.

**Land use and management recommendations**

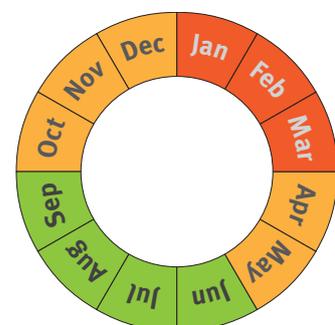
**Managing stock access and grazing**

Well managed grazing over the dry season, through light stocking rates, lighter stock (e.g. weaners) and/or rotational or flexible grazing can provide production benefits whilst maintaining biodiversity.

Wet season spelling and flexible/rotational grazing regimes provides a respite from grazing and disturbance, allowing wetland plants to set seed and germinate and for young plants to grow. Spelling also provides opportunities for frogs, birds and other wildlife to breed.

Grazing regimes should be determined based on the management objectives, condition, weed threat and water flows in the wetland.

Indicative grazing seasonality diagram (green managed grazing, red spelling, amber limited grazing). This may vary depending on wetland condition, climate and key management objectives\*:



\* For example, if the management objective is to control exotic pasture grasses in seasonally dry climates, light stocking over the wet season could be appropriate).

## Managing water

Road crossings, floodgates, levee-banks, ponded pastures and dams can modify water regimes, as can draining wetlands for development. This impacts vegetation communities and the wildlife that these wetlands can support. Changes in water flow can also seriously impact fish movement within and between wetlands.

Ponded pastures, levees and bunds must not be constructed in or adjacent to coastal tree swamps.

Coastal tree swamps are fairly tolerant to nutrient loads, but overloading the wetland will eventually lead to dieback of wetland trees and invasion by weeds. Cattle camps should be located away from these wetlands to reduce nutrient input from stock urine and faeces.

## Managing fire

In their natural state, coastal tree swamps are relatively fire tolerant due to the high moisture levels and low fuel loads supporting low intensity, mosaic burns. Fire also has a role in encouraging the recruitment of *Melaleuca* spp. These wetlands can act as natural firebreaks and a refuge for animals during fire in adjacent terrestrial areas.

To maintain the integrity of coastal tree swamps burns should only be:

- low to moderate intensity
- patchy or mosaic, creating a mosaic of burnt and unburnt areas
- carried out when the wetland soil is saturated
- carried out at intervals at which fire would have naturally occurred or been used by Traditional Owners (e.g. recommendations vary from 15-30 years for fire sensitive wetlands to 3-8 years for more open wetlands in seasonally dry climatic regions).



**Figure 53** Ungrazed exotic pasture grasses can create large fuel loads which pose a risk of intense fires in seasonally dry climates

Too frequent fires can result in a net loss of nutrients from the system.

Different burn regimes may be required to meet specific management objectives, such as weed control.

## Managing weeds

Exotic pasture grasses and weeds can dominate the understorey causing major changes to the vegetation community and wetland ecosystem services by:

- outcompeting and excluding native grasses and sedges, important for native animals
- smothering the water surface and degrading water quality and habitat for fish and other aquatic animals
- increasing fuel loads leading to frequent, intense fires that kill wetland trees and alter the vegetation composition to a grass dominated open-forest (particularly in seasonally dry climates).

Weeds are spread by animals, water and vehicles and will often dominate areas that have been disturbed by machinery, frequent fires or overgrazing. For example, the presence of Devil's fig can be a sign of heavy grazing pressure.

In wetlands invaded by exotic pasture grasses, the exclusion of stock can allow exotic pasture grasses to smother the wetland leading to the loss of wetland ecosystem services and values. Grazing can help reduce the dominance of exotic pasture grasses and maintain wetland values.



**Figure 54** Dry season grazing is keeping olive hymenachne cropped in this wetland near Mackay.

In the seasonal dry tropics trials have shown that light grazing throughout the wet season (to prevent exotic pasture dominance over the growing season) and moderate grazing pressure at the end of the dry season (to crop down exotic pastures) can be an effective grazing regime for controlling the dominance of exotic pasture grasses.

An integrated program of controlled grazing, carefully planned and managed burns and natural water level fluctuations can help control weeds and exotic pasture grasses. Refer to <[www.deedi.qld.gov.au](http://www.deedi.qld.gov.au)> or your local government weed management officer for more information and guidance.

## Managing animal pests

Feral pigs can cause extensive damage to coastal tree swamps, by fouling and muddying the water, digging up plants, destabilising banks and destroying the nests of native animals.

Pig control programs are recommended to reduce numbers, refer to <[www.deedi.qld.gov.au](http://www.deedi.qld.gov.au)> for advice.



**Figure 55** Pigs have caused sediment disturbance and destroyed native plants in this wetland in Lakefield National Park. Source: DERM

### Other land use limitations

Regulations and approvals may apply to works or activities in and around these wetlands, such as:

- removing or disturbing vegetation
- earthworks (filling or excavation)
- construction of infrastructure such as levees, causeways, weirs, roads, culverts or works that alter water flows (drainage works or water storages)
- taking or interfering with water
- disturbance of or tampering with animal breeding places, such as nests or hollows, where protected wildlife breed or raise their young
- works within protected areas, such as declared Fish Habitat Areas, Ramsar listed wetlands and declared Wild Rivers areas.



**Figure 56** Tree swamps are often associated with grass, sedge and herb swamps. There may be other requirements for grazing enterprises, such as maintaining ground cover and land condition and managing weeds and pests. Refer to the Legislation Toolbox for information ([www.derm.qld.gov.au/wetlandinfo/site/PPL/WPLST.html](http://www.derm.qld.gov.au/wetlandinfo/site/PPL/WPLST.html)).

Coastal tree swamps are key contributors to primary production which is then exported to adjacent tidal habitats. The association with other wetland types means that the management of coastal tree swamps should be undertaken in conjunction with adjacent wetlands.

### Conservation features

Underlying soils are often PASS. When excavated or drained PASS reacts with air to produce sulphuric acid, which can cause significant environmental and economic impacts.

Crocodiles may be a safety consideration for humans and stock in central and north Queensland.

Many vulnerable and endangered plants occur in coastal tree swamps, including species of orchid, wattle and grevillea.

*Melaleuca* spp. trees provide an important source of nectar and pollen for insects, birds and bats and are used for nesting and roosting. Frogs are common in the understorey vegetation and fish use these wetlands when they are seasonally inundated.

### Relevant land types

Tea-tree flats (CB12), Coastal teatree plains (FT10), Coastal tea-tree plains (MW04), Sandy forest (NG13), Coastal country (SG03).

### Regional Ecosystems

There are 29 Regional Ecosystems (RE's) that contain coastal tree swamps:

- Gulf plains: 2.3.28x11
- Cape York Peninsula: **3.2.3\***, **3.2.4\***, **3.2.14\***, **3.3.12\***
- Wet tropics: **7.2.8\***, **7.2.9\***, **7.3.5\***, **7.3.34\***
- Central Queensland coast: **8.1.5\***, **8.2.4\***, **8.2.7a,b&e\***, **8.2.11\***, **8.2.13b\***, **8.3.11\***, **8.3.13a&b\***, **8.5.2\***, **8.5.6\***
- Brigalow belt: 11.3.12
- Southeast Queensland: **12.1.1\***, 12.2.5a, 12.2.7, **12.3.4\***, 12.3.5, 12.3.6, 12.5.4

\* Classified as 'of concern' or 'endangered'

### Further information and references

For information on the use of late dry season grazing and fire to manage exotic pasture grasses in the seasonal dry tropics see:

- Tait, J. (2010) *Guidelines for the use of grazing for management of exotic pasture weeds in wetland and riparian habitats*. WetlandCare Australia, NSW
- Adams, E. *Tedlands Station Wetlands Project – Grazing and Fire Regime Management*. Information Bulletin No. 1 for the GBR Coastal Wetland Protection Program. Mackay Whitsunday NRM Group.
- Bloor, M. and Tait, J. *Tedlands Station Wetlands*. Mackay Whitsunday NRM Group. Australia.
- Department of Environment and Resource Management (2009) *Regional Ecosystems*. Viewed 4 November 2010. ([www.derm.qld.gov.au/wildlife-ecosystems/biodiversity/regional\\_ecosystems/index](http://www.derm.qld.gov.au/wildlife-ecosystems/biodiversity/regional_ecosystems/index))
- Department of Primary Industries and Fisheries (2009) *Land types of Queensland*. State of Queensland (Department of Primary Industries and Fisheries), Brisbane.
- Joyce, K. (2006) *Wetland Management Profile – Coastal Melaleuca Swamp Wetlands*. Queensland Wetlands Program, Brisbane.

**Plant species commonly found in coastal tree swamps (floodplain and non-floodplain):  
*Melaleuca* spp. and *Eucalyptus* spp.**

Scientific name	Common Name
<b>Grasses</b>	
<i>Chrysopogon fallax</i>	Golden beard grass
<i>Heteropogon</i> spp.	Speargrass
<i>Imperata cylindrica</i>	Blady grass
<i>Ischaemum</i> spp.	
<i>Leersia hexandra</i>	Swamp rice grass
<i>Phragmites australis</i>	Common reed
<i>Sporobolus virginicus</i>	Saltwater/marine couch
<i>Themeda triandra</i>	Kangaroo grass
<b>Sedges and Rushes</b>	
<i>Baumea articulata</i>	Jointed twigrush
<i>Baumea rubiginosa</i>	Soft twigrush
<i>Cyperus difformis</i>	Dirty dora/ rice sedge
<i>Cyperus trinervis</i>	Sedge
<i>Cyperus</i> spp.	Sedge
<i>Dapsilanthus ramosus</i>	Saw-Sedge
<i>Gahnia sieberiana</i>	Saw-Sedge
<i>Isolepis nodosa</i>	Knobby club rush
<i>Lepironia articulata</i>	
<i>Schoenus brevifolius</i>	Bogrush
<b>Broadleaf herbs and shrubs</b>	
<i>Acrostichum speciosum</i>	Mangrove fern
<i>Blechnum</i> spp.	Ferns
<i>Boronia</i> spp.	Boronia
<i>Crinum pedunculatum</i>	Mangrove lily
<i>Durringtonia paludosa</i>	Durringtonia
<b>Broadleaf herbs and shrubs (continued)</b>	
<i>Lycopodiella serpentina</i>	Bog clubmoss
<i>Lygodium microphyllum</i>	Climbing maidenhair
<i>Phaius</i> spp.	Swamp orchid
<i>Sprengelia sprengelioides</i>	Sprengelia
<i>Stenochlaena palustris</i>	Climbing swamp fern
<b>Trees</b>	
<i>Acacia</i> spp.	Wattle
<i>Casuarina</i> spp.	She-oak
<i>Corymbia</i> spp.	Bloodwood
<i>Eucalyptus</i> spp.	Gum tree
<i>Excoecaria parvifolia</i>	Gutta-percha
<i>Grevillea</i> spp.	Grevillea

Scientific name	Common Name
<b>Trees (continued)</b>	
<i>Livistona</i> spp.	Cabbage tree palm
<i>Lophostemon</i> spp.	Swamp box
<i>Melaleuca</i> spp.	Paperbark or tea-tree
<i>Pandanus</i> spp.	Screw pine
<i>Xanthorrhoea</i> spp.	Grass tree
<b>Waterlillies and other aquatic plants</b>	
<i>Nymphaea</i> spp.	Waterlillies
<b>Introduced species and weeds</b>	
<i>Annona glabra</i>	Pond apple
<i>Baccharis halimifolia</i>	Groundsel Bush
<i>Brachiaria mutica</i>	Paragrass
<i>Cryptostegia grandiflora</i>	Rubber vine
<i>Cyperus papyrus</i>	Papyrus
<i>Echinochloa polystachya</i>	Aleman grass
<i>Eichhornia crassipes</i>	Water hyacinth
<i>Hymenachne amplexicaulis</i>	Olive hymenachne
<i>Lantana camara</i>	Lantana
<i>Solanum torvum</i>	Devil's fig