

2.4 Coastal riverine wetlands

Description

- Occur as rivers, creeks, channels, drainage lines and streams.
- Have defined bed and banks and possibly an adjoining floodplain.
- Has permanent or ephemeral water flow or water holes.
- Generally freshwater but may have saltwater influence.
- Banks (the 'riparian area') are vegetated, usually with an understorey, shrub and tree layers although in drier areas, vegetation can be grass with an open woodland canopy.
- Often have a close association with groundwater.

Grazing value:



Moderate grazing value

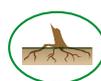
Wetland values and ecosystem services:



Water security



Water quality



Stabilising soil



Flood mitigation



Integrated pest management



Social and cultural



Carbon storage



Habitat



Figure 63 Coastal riverine wetland north of Townsville

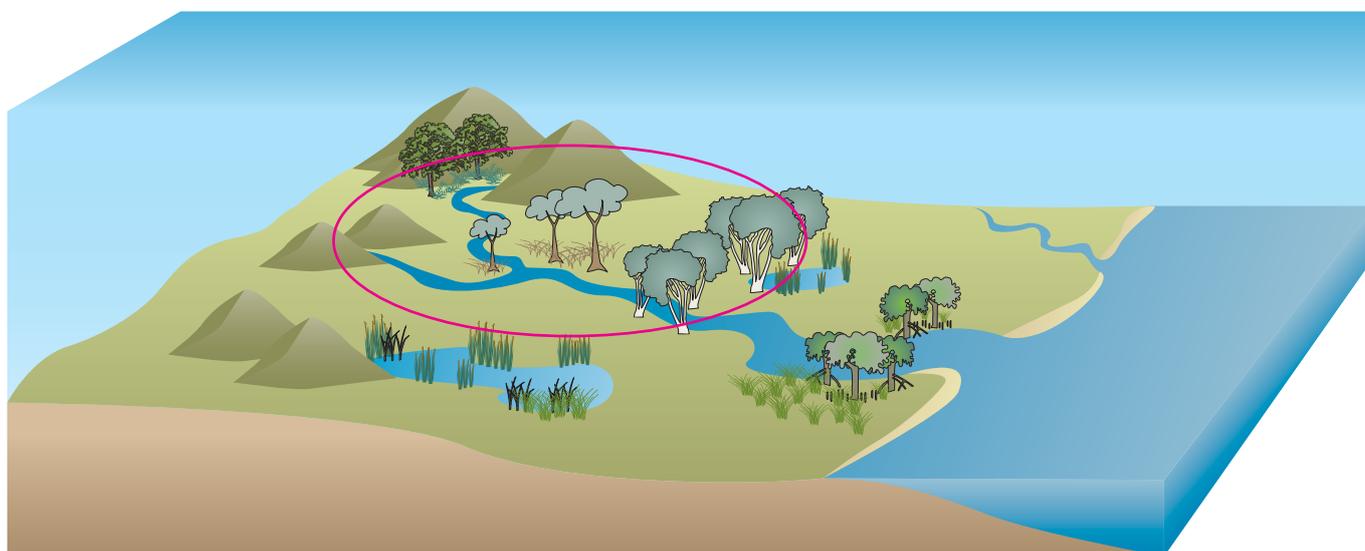


Figure 64 Coastal riverine wetlands in the landscape

Landform

Occur on a wide range of landforms, from broad channels through floodplains to narrow drainage lines on steep land.

Vegetation description

Healthy coastal riverine wetlands generally have a good structural diversity with trees and shrubs of different ages, heights and forms and an understorey of groundcovers such as grasses, sedges and herbs. Vegetation types and structure vary depending on the climate, region, position in the landscape, water regime, droughts and disturbance. In drier areas, riparian vegetation can be more grass-dominated with a sparse, open tree canopy.



Figure 65 Healthy coastal riverine wetland with a diversity of trees, shrubs and ground covers

Native pastures

Black and giant speargrass, golden beard grass, fairy grass, blady grass, umbrella cane grass and marsh/channel millet.

Sown pastures

Many riparian areas will have improved pastures, including rhodes grass, signal grass, pangola grass, guinea grass, para grass and tulley grass.

Exotic pasture grasses and weeds

Paragrass, olive hymenachne, aleman grass, pond apple, grousel bush, rubbervine, lantana, parkinsonia, noogoora burr, papyrus, water hyacinth, water lettuce, salvinia and cabomba.

Exotic pasture grasses are well established in many coastal riverine wetlands and should not be introduced into new wetland areas.

Soil

A broad range of soil types depending on the position in the landscape, including black cracking clays, loams, sands and even bedrock. Soil originally from alluvial deposits.

Potential Acid Sulfate Soil (PASS) may be present in underlying soils in the coastal floodplain.

Land use and management recommendations

Managing stock access and grazing

Coastal riverine wetlands and the adjacent frontage country (the land occurring from the riparian area usually to the extent of the floodplain) are very productive areas. Well managed stock access and regular spelling can provide stock with valuable fodder and water and minimise impacts from water fouling, erosion and degradation of riparian vegetation.



Figure 66 Riparian area and frontage country with good ground cover on a coastal grazing property.

Stock access and grazing should be managed:

- through strategic fencing and rotational/flexible grazing to provide regular breaks from grazing pressure
- by locating watering points and cattle camps away from wetlands to reduce the time stock spend wallowing and defecating in the water
- through light stocking rates or lighter stock (e.g. weaners)
- through exclusion when stream banks are saturated to avoid bank slumping and pugging
- by minimising access to small, isolated water holes remaining after extended dry periods to reduce water fouling and algal blooms
- through wet season spelling to provide opportunities for vegetation to germinate and establish. Wet season spelling recommendations for coastal riverine wetlands and frontage country vary from 6-8 weeks to the entire wet season, depending on the region, climate, landscape variables and management objectives (e.g. weed control).

Grazing regimes need to be flexible and decided based on regular monitoring and assessment of wetland condition and frontage country ground cover targets (see monitoring and assessing coastal wetlands on page 42).

Maintaining good ground cover in the frontage country is essential to minimise erosion and increase sediment trapping. Grass buffers on flat land have been shown to trap 80% of incoming sediment in runoff, even under heavy rainfall (McKergow et. al. 1999). Ground cover targets for frontage country differ depending on the region, rainfall and the site attributes including topography, soil and existing vegetation. Advice for a specific property should be sought from Regional NRM bodies or local Department of Employment, Economic Development and Innovation (DEEDI) grazing extension staff.

Managing water

Impoundments, causeways, floodgates and bunds across coastal riverine wetlands alter water flows impacting vegetation, downstream water regimes, water quality and fish passage.



Figure 67 Crossings and culverts such as this, alter water flows and prevent fish passage. Nutrients, from dung and urine, can lead to algae blooms and low oxygen levels in the water. These wetlands are particularly susceptible during the dry season and times of drought, when there is little or no water flow and only isolated water holes. These residual pools provide vital refuges for fish and wildlife. Stock use of these wetlands needs to be closely monitored and controlled to minimise impacts on water quality (for both stock drinking water and wildlife).

Structures built across riverine wetlands should be designed to allow natural water flow and fish passage.

Contact DEEDI on 13 25 23 for information on designing crossings. Guidelines are also available at <http://www.jcu.edu.au/fishpassagedesign/pub/cfpg/index.htm>

Managing fire

Fringing riparian communities are not adapted to regular fire. Burns are not recommended unless there is a specific management issue to address, such as weeds. Intense and extensive fires degrade riparian vegetation structure and destroy critical wildlife habitats. Exotic pasture grasses, such as guinea grass, can support these frequent intense fires and should be managed through strategic grazing to reduce the biomass of these grasses.

If controlled burns are required (e.g. for weed control) they should only occur when the water level is deep enough to protect the bases of aquatic plants. Fires in adjoining terrestrial paddocks must also be carefully managed and timed to when wetland soils are saturated to prevent the fire entering wetlands.

Grazing should be restricted immediately after a burn as cattle will preferentially eat the new shoots (unless the key objective is exotic pasture control, whereby grazing may help control the regrowth).

Managing weeds

Coastal riverine wetlands are prone to invasion by weeds and exotic pasture grasses which can alter the vegetation communities and degrade the vital ecosystem services provided by these wetlands.



Figure 68 Ungrazed exotic pasture grasses can create large fuel loads and a threat of intense fire in seasonally dry climates

Exotic pasture grasses:

- outcompete and exclude native plants which provide food and habitat for wildlife
- grow across the water surface, affecting water flow and degrading water quality and habitat
- create high fuel loads in seasonally dry climates which support intense and frequent fires that can kill wetland trees.

Where exotic pasture grasses are present, grazing should be used strategically to reduce the dominance of these grasses, allow recruitment and growth of native plants and help reduce fire fuel loads.

Control of weeds requires an integrated management approach using a range of weed prevention and control techniques. The Pest Management Officer from your local government should be contacted for advice. For more information see <www.deedi.qld.gov.au>.

Managing animal pests

Feral pigs can cause extensive damage to coastal riverine wetlands, by destroying vegetation, spreading weeds, disturbing soils, fouling and muddying water and causing bank erosion and slumping. Feral horses are also prevalent in some areas of Queensland, causing overgrazing, soil compaction and water quality degradation in wetlands. For information on controlling pests, refer to <www.deedi.qld.gov.au>.

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 and Ramsar listed wetlands
- agricultural activities within declared Wild Rivers areas.

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).

Many coastal riverine wetlands in Queensland form the boundary between properties, requiring joint management.

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

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

Conservation features

Riparian vegetation provides habitat and food for wildlife, shade, nutrient and sediment trapping and bank stabilisation. Riparian areas with vegetation cover are more resistant to erosion and are more effective at trapping sediments and nutrients than bare areas. Research (Butler, D.M. 2007) has shown that riparian areas with vegetation cover exported 85% less total Nitrogen (from cattle urine and dung) than bare ground.

Standing dead trees with hollows, fallen logs and leaf litter are an essential part of riparian areas, providing shelter and nesting sites for birds, mammals, reptiles and insects, including species that can assist in integrated pest management. Snags in the wetland are a habitat for fish, turtles and other aquatic animals.

Coastal riverine wetlands provide corridors for wildlife movement and are vital for fish movement and connectivity between freshwater wetlands and estuaries.

Relevant land types

Coastal riverine wetlands can occur in any coastal land type, commonly: Blue gum on alluvial plains (MO01), Blue gum flats (CB02), Blue gum/river red gum flats (FT02), Coastal flats with mixed Eucalypts on grey clays (FT08), Coolibah floodplains (FT11), Alluvial flats and plains (MW01), Clayey alluvials (BD08), Loamy alluvials (BD13), Alluvial (WT01), Frontage (NG03), Coastal country (SG03), Frontage (SG04).

Regional Ecosystems

There are 28 Regional Ecosystems (RE's) that contain coastal riverine wetlands:

- Gulf plains: 2.3.1×30, 2.3.7, **2.3.17***, **2.3.24***, **2.3.25***, **2.3.26***
- Cape York Peninsula: 3.3.1, 3.3.5, 3.3.10, 3.3.25, **3.3.66×1a&b***
- Wet tropics: **7.1.4***, **7.3.16***, **7.3.23***, **7.3.25***, **7.3.26***, **7.3.28***, **7.3.49***, **7.3.50***, **7.11.42***
- Central Queensland coast: **8.3.1***, **8.3.3***
- Brigalow belt: **11.3.3***, **11.3.25***, **11.3.38***
- South-east Queensland: **12.3.2***, 12.3.7

* Classified as 'of concern' or 'endangered'

Further information and references

For more information on managing grazing around coastal riverine wetlands see:

- Coughlin, T., O'Reagain, P., Nelson, B., Butler, B. and Burrows, D. (2008) *Managing for water quality within grazing lands of the Burdekin Catchment – Guidelines for Land Managers*. Burdekin Solutions Ltd, Townsville (www.nqdrytropics.com.au)
- Tait, J. (2010) *Guidelines for the use of grazing for management of exotic pasture weeds in wetland and riparian habitats*. WetlandCare Australia, NSW.
- Staton, J. and O'Sullivan, J. (2006) *Stock and waterways: a manager's guide*. Land and Water Australia, Canberra.
- Peck, G. (2006) *Property Planning: Fencing to landtype – Riparian lands*. Fitzroy Basin Association, Rockhampton (www.fba.org.au)
- Peck, G. (2006) *Property planning: Sustainable grazing on riparian lands – why and how to do it*. Fitzroy Basin Association, Rockhampton. (www.fba.org.au)
- Butler, D.M., Ranells, N.N., Franklin, D.H., Poore, M.H. and Green, J.T. (2007) Ground cover impacts on nitrogen export from manured riparian pasture. *Journal of Environmental Quality* Vol 36(1). Pg. 155-162.
- Department of Environment and Resource Management (2009) *Regional Ecosystems*. Viewed 4 November 2010. (www.derm.qld.gov.au/wildlife-ecosystems/biodiversity/regional_ecosystems/index)
- Department of Primary Industries and Fisheries (2009), *Landtypes of Queensland*. State of Queensland, Brisbane.
- McKergow, L., Prosser, I. and Heiner, D. (1999) *Preliminary results on the effectiveness of riparian buffers in Far North Queensland*. Second Australian Stream Management Conference. Adelaide.

Plant species commonly found in coastal riverine wetlands

Scientific name	Common Name
Grasses	
<i>Chrysopogon fallax</i>	Golden beard grass
<i>Echinochloa inundata</i>	Marsh/channel millet
<i>Heteropogon</i> spp.	Speargrass
<i>Hymenachne acutigluma</i>	Hymenachne
<i>Imperata cylindrica</i>	Blady grass
<i>Leptochloa digitata</i>	Umbrella cane grass
<i>Paspalidium jubiflorum</i>	Warrego (summer) grass
<i>Phragmites australis</i>	Common reed
<i>Pseudoraphis spinescens</i>	Spiny mudgrass
<i>Sporobolus caroli</i>	Fairy grass
Sedges and Rushes	
<i>Bolboschoenus fluviatilis</i>	Marsh club-rush
<i>Cyperus exaltatus</i>	Tall flatsedge/giant sedge
<i>Eleocharis sphacelata</i>	Tall spikerush
<i>Philydrum lanuginosum</i>	Frogsmouth
<i>Typha domingensis</i>	Cumbungi, bulrush
Legumes	
<i>Sesbania cannabina</i>	Sesbania pea
<i>Vachellia farnesiana</i>	Mimosa bush
Broadleaf herbs and shrubs	
<i>Crinum pedunculatum</i>	Mangrove lily
<i>Ludwigia peploides</i>	Water primrose
<i>Muehlenbeckia florulenta</i>	Lignum
Trees	
<i>Acacia</i> spp.	Wattle
<i>Callistemon</i> spp.	Bottlebrush
<i>Casuarina</i> spp.	She-oak
<i>Corymbia</i> spp.	Bloodwood
<i>Corypha utan</i>	Palm
<i>Eucalyptus</i> spp.	Gum tree
<i>Grevillea</i> spp.	Grevillea
<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
Waterlillies and other aquatic plants	
<i>Blyxa</i> spp.	Blyxa
<i>Ceratophyllum demersum</i>	Hornwort
<i>Hydrilla verticillata</i>	Hydrilla

Scientific name	Common Name
Waterlillies and other aquatic plants (continued)	
<i>Marsilea</i> spp.	Nardoo
<i>Monochoria cyanea</i>	Bog lily
<i>Myriophyllum</i> spp.	Water milfoil
<i>Nelumbo nucifera</i>	Pink lotus
<i>Nymphaea</i> spp.	Waterlillies
<i>Nymphoides</i> spp.	Marshworts
<i>Ottelia alismoides</i>	Ottelia
<i>Ottelia ovalifolia</i>	Swamp lily
<i>Potamogeton</i> spp.	Curly pondweed
<i>Utricularia gibba</i>	Yellow bladderwort
<i>Vallisneria</i> spp.	Ribbonweed
Introduced species and weeds	
<i>Annona glabra</i>	Pond apple
<i>Baccharis halimifolia</i>	Groundsel Bush
<i>Brachiaria mutica</i>	Paragrass
<i>Cabomba caroliniana</i>	Cabomba
<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>Parkinsonia aculeata</i>	Parkinsonia
<i>Pistia stratiotes</i>	Water lettuce
<i>Salvinia molesta</i>	Salvinia
<i>Xanthium occidentale</i>	Noogoora burr