



Coastal wetlands—Mangroves and saltmarshes

Australia's mangroves and saltmarshes are ecologically important ecosystems that link the land and sea, providing productive habitats for a range of species, including migratory shorebirds, and supporting commercial and recreational fishing. Significant losses of saltmarsh, and the recent sudden and widespread death of mangroves in northern Australia, has led to community concern over these important habitats.

What are mangroves and saltmarshes?

Mangroves and saltmarshes are intertidal communities of plants that grow on the foreshores of coastal lakes and estuaries. These plants are adapted to salty conditions which most other vegetation cannot tolerate.

Mangroves are woody plants growing in the intertidal zone, running parallel to the shoreline or tidal creek systems, usually at the mean high water level. Mangroves exist in a constantly changing environment. Periodically the sea inundates the communities with salty water while, at low tide, especially during periods of high rainfall, they may be exposed to fresh water flows.

Saltmarshes occupy the high tide zone and include plants such as sedges, rushes, reeds, grasses, succulent herbs and shrubs that can tolerate high soil salinity and occasional inundation with salt water. Saltmarsh areas have low vegetation, often interspersed with bare patches or salt pans.

Why are mangroves and saltmarshes important?

Coastal mangroves and saltmarshes have historically been undervalued and considered by many to be wastelands. As a result many areas have been drained, reclaimed, become degraded from a range of human activities or otherwise lost.

We now understand the ecological value of these habitats which serve a number of purposes:

- provide feeding and breeding habitat for fish, birds and crustaceans
- act as filters for nutrients and sediments, reduce erosion and maintain water quality
- provide protection from storms and cyclones
- act as a carbon sink.

Mangroves are essential breeding grounds for fish stock, including prawns, crabs and fin fish such as barramundi, many of which are important for the fishing industry. Saltmarsh also provides shelter for fish, especially juveniles and smaller fish species, when inundation occurs during high tides. Studies have recorded over 40 species of fish inhabiting tidal saltmarsh areas, including commercial and recreational species such as yellowfin, bream, sand whiting, mullet, garfish, eels and crabs.

Invertebrates, including crabs, prawns, molluscs, spiders and insects are prolific in areas of saltmarsh and are preyed upon by fish and birds. Migratory waders, including species listed under international bird agreements, use Australia's saltmarshes for feeding and roosting.

Coastal wetlands trap and stabilise sediments to lessen the effects of floodwaters and tidal movements, collect and recycle nutrients and contaminants from run-off and help maintain water quality.

Both mangroves and saltmarshes protect coastal foreshores by absorbing the energy of wind and wave action and providing a buffer that helps minimise erosion. With predicted increases in storm surge intensity and rising sea levels associated with climate change, these habitats will become increasingly important in protecting coasts.

Mangroves, saltmarsh and seagrasses capture and store large quantities of carbon both in plants and in the sediment below ('blue carbon'). Australia's coastal wetland ecosystems capture carbon on a per hectare basis at rates of up to 66 times higher and store 5 times more carbon in their soils than those of terrestrial ecosystems such as forests.

What is the status of Australia's mangroves and saltmarshes?

Mangroves occur throughout Australia's coastal region, particularly in the north and east, covering an area of about 11,500 km². Australia is home to seven per cent of the world's mangroves. It is estimated that around 17 per cent of Australia's mangroves have been destroyed since European settlement.

Saltmarshes cover an area of over 13,000 km², with greater species diversity in southern Australia. Over 30% of these areas are modified to some degree. It has been estimated that, since 1950, most estuaries in south-east Australia have lost over a quarter of the saltmarsh, with some estuaries losing up to 80 per cent. Recognition of the value of and threats to saltmarshes, led to the listing of Subtropical and Temperate Coastal Saltmarsh Communities as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC).

Coastal lakes and estuaries are largely managed by state and territory governments with significant areas of mangroves and saltmarsh protected in National Parks, Indigenous Protected Areas and Marine Protected Areas. Some mangrove and saltmarsh communities are included in internationally listed Ramsar wetlands. The ecological character of Ramsar wetlands is also protected under the EPBC.



Photo: Mangrove and salt marsh communities

What are the threats to mangroves and saltmarshes?

Many areas of coastal wetland, particularly those near urban centres, have been lost or fragmented during the last 200 years, as a result of reclamation, drainage works, unrestricted stock access, weed invasion, dumping, stormwater run-off and damage from off-road vehicles.

As populations increase in the coastal zone, the risk of further declines in these habitats increases. Greater pressure is placed on coastal vegetation communities by both direct impacts (such as reclamation) and indirect impacts (e.g. changes in natural tidal flows).

Major threats include:

- reclamation for development—including for housing, transport and other infrastructure
- shore protection works such as sea walls
- changes to freshwater and tidal flows and drainage to reclaim land
- uncontrolled stock access to saltmarshes
- off-road vehicles and pedestrian traffic
- rubbish and pollution
- pressure by nearby communities for mosquito control
- weed invasion.

Development, climate change and sea level rise are likely to result in changes to the distribution and abundance of species and overall structure of ecological communities. In many cases, the migration of species and communities inland is blocked by development, while increased sedimentation encourages the migration of mangroves into areas of saltmarsh.

Sudden and widespread losses of mangrove communities in the Gulf of Carpentaria in northern Australia in late 2015 are being investigated by conservation agencies and scientific experts. Possible causes include drought, high water temperatures and high salinity.

How can we help protect mangroves and saltmarshes?

Actions we can take include:

- establishing buffer zones between coastal habitats and adjacent development
- identifying and protecting areas where coastal habitats can retreat with sea level rise
- fencing along the intertidal zone to prevent livestock access
- removing barriers to restore natural tidal flows
- undertaking rehabilitation projects to restore habitats
- designing waterfront structures such as boat ramps jetties and pathways to avoid or minimise impacts on water flows
- avoiding driving, walking or biking through saltmarsh areas
- avoiding stormwater discharges into coastal habitats
- disposing of rubbish and chemicals responsibly
- removing weeds.

The most successful restoration is achieved by creating the right conditions for water flows to enable natural regeneration or recolonisation.

Continued research and monitoring will improve our ability to understand changes in the condition of these communities, and what we can do to better manage them.

More information

MangroveWatch Australia www.mangrovewatch.org.au/index.php?option=com_content&view=section&layout=blog&id=18&Itemid=300032

WetlandInfo—Wetland Management Profiles—Mangroves and Saltmarshes wetlandinfo.ehp.qld.gov.au/wetlands/resources/publications/fact-sheets

NSW Primefacts—Mangroves www.dpi.nsw.gov.au/data/assets/pdf_file/0020/236234/mangroves.pdf

NSW Primefacts—Coastal saltmarsh www.dpi.nsw.gov.au/data/assets/pdf_file/0007/459628/Coastal-Saltmarsh-Primefact.pdf

Mangroves of Victorian—Information kit parkweb.vic.gov.au/data/assets/pdf_file/0007/510937/Mangroves_Vic_infokit_2011.pdf

Did you know?

The mangroves and saltmarshes of Australia, provide roosting and feeding sites for over 30 species of shorebirds, many of which fly annually over 10,000 km to Siberia and Alaska along the East Asian Australasian Flyway.

Mangroves and coastal wetlands annually sequester carbon at a rate two to four times greater than mature tropical forests and store three to five times more carbon per equivalent area than tropical forests. Most coastal carbon is stored in the soil, not in above-ground plant material as is the case with tropical forests.

At least 2/3 of all the fish consumed worldwide are dependent on coastal wetlands. It has been estimated that the contribution of mangrove-related species in eastern Australia is around 67% of the entire commercial catch.

The grey mangrove has spiky vertical roots, called peg roots or 'pneumatophores', which can be seen at low tide protruding from the mud or sand. These roots act like snorkels, drawing air into the underlying root system, allowing the plant to breathe, survive and grow in soils that are too poorly aerated to allow other terrestrial plants to establish.

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