



Coastal Dune Vegetation

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What is coastal dune vegetation?

Plants that grow on beaches and sand dunes form communities known as coastal dune vegetation. Distinct vegetation bands or 'zones' are a common feature, reflecting seaside conditions and soil development.

Queensland is home to some of the world's best examples of coastal sand dune and vegetation systems. It is partly because of their sheer size and inaccessibility that, like other wilderness areas, they have escaped large scale clearing. Fraser Island and Morton Island are two such systems and are living proof of the extent to which coastal vegetation can develop. Complex forest communities that are able to grow on sand for hundreds of thousands of years have evolved out of the simple assemblages of grasses, herbs and shrubs that we commonly associate with coastal dunes.



Spinifex sericeus stabilises foredunes on the southern side of Bribie Island.

Sadly, much of eastern Australia's coastal vegetation has been modified or cleared for development, leaving us with only "snap shots" of what were once extensive, dynamic and valued vegetation communities.

Our coast under threat

In much of Queensland, coastal sand dunes are highly threatened by urban development and recreational use. At the same time, like most parts of the east Australian seaboard, the coastline is in retreat due a combination of factors including the interruption of natural sand replenishment processes and slow sea level rise. Other threats include mining, vehicles, feral and domestic animals (eg. horses, dogs), human trampling and introduced plants (particularly competitive species).



In Hervey Bay, foreshore vegetation provides an important buffer against coastal weather and tidal extremes.

Natural disturbance

Natural disturbance has always been a normal part of beach and dune building processes.

Natural sources of disturbance include:

- ongoing sand abrasion
- salt spray
- erosion (loss of sand)
- accretion (build up of sand)
- wind blasting and dehydration
- wave attack

Such influences increase in intensity during storm events and king tides. Some plants are able to survive and even flourish. Species such as *Spinifex* are able to change their form (morphology) in response to changing conditions.

Today, however, natural disturbances often threaten dune systems because of their reduced size and connectivity. Often little or no natural buffer remains. Artificial rock walls and reefs are constructed, intercepting sand intended for deposition elsewhere. Lost sand is artificially replenished. In general, a lot of time, money and effort go toward trying to stabilise or control what are naturally dynamic systems.

Symptoms of "unhealthy" dune vegetation include:

- changes in dune shape and stability.
- weed invasion and spread.
- severe erosion (eg foredune collapse, blowouts).
- loss of natural regeneration and recruitment of native species.
- decline in local wildlife.



Pioneering plants

Coastal vegetation is itself *dynamic*. Earlier, simpler plant communities pave the way for a series of future, more complex communities. This process is known as succession and is reflected in the formation of distinct "zones" that run parallel to the shore.



The fruits and leaves of *Carpobrotus glaucescens* were eaten by Aboriginal people. For many of these people, coastal sand dune areas were an important part of culture and survival. (Photo courtesy of Melinda Adamson)

Along the front of the dunes, on the beach or foredune, so-called pioneer species grow, amongst them the salt tolerant grasses, creepers and groundcovers such as beach spinifex (*Spinifex sericeus*), pig face (*Carpobrotus* spp.), goatsfoot (*Ipomea pes-caprae*) and guinea flower (*Hibbertia scandens*).

Behind the pioneer species, coastal sheoaks (*Casuarina equisetifolia*) often form a distinctively taller band, pruned on its seaward side by the salt-laden winds.

Other vegetation communities occur further inland, for instance *Banksia* woodlands, mangroves, salt marsh and *Melaleuca* wetlands. Pioneer species can occur here, although in much lower numbers. Extensive dune systems such as those on Fraser Island support more mature, complex communities including rainforest and wet sclerophyll forest.

Regeneration

Traditionally, non-native species were used to stabilise dunes, particularly fast-growing grasses. However stability came at the expense of local native species that had evolved to *survive*, rather than *compete*.



The coloured sands at Rainbow Beach are one of Queensland's many coastal areas worth protecting.

Native species are a sound alternative for revegetation, especially when propagated from local seed. Techniques should be continually refined to suit local needs.

Much can be learned from an experimental approach tailored to the area and its conditions, particularly if a good monitoring and evaluation framework is applied. Results are not always obvious. Some areas, for example, have shown benefits from light disturbances such as trampling or sand burial in stimulating the growth of stabilising plants like *Spinifex*.

Look closely at local "intact" dune vegetation - its structure, responses and species associations - as a guide and source of ideas for regeneration.

What you can do

- Become a Greening Australia (GA) member & get involved in our volunteer activities.
- Learn more and gain skills through GA training workshops.
- Get involved in dune stabilisation projects that use native species through GA and local Coastcare groups.
- Treat coastal vegetation with care.

References

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