

# Management guidelines for dune use

## Dune use for coastal protection

### General

Queensland's sandy beaches are usually backed by a complex system of sand dunes and interdune depressions called swales. There is an increasing demand from people to use the beaches and dunes more intensively than they have been used in the past. As the dune system protects the coastline against erosion, increasing use should be carefully planned to minimise damage to the dunes and their vegetation.

### Dune structure and vegetation

The structure and vegetation cover on coastal dune systems vary markedly, dependent on

location and climate. Figure 1 shows typical cross-sections derived from surveys of sand dunes in southern, central and northern Queensland, and indicates the general zones found across these relatively undisturbed beach and dune areas.

### The beach and foredune

Within the sections of the coastal sand dunes which are vulnerable to erosion in the foreseeable future are zones which are extremely sensitive to human activities and development. At the same time, other zones are more tolerant and are suitable for certain types of use.

### Dune profiles — Tolerance levels

Zone	Sub-zone	Tolerance	Acceptable/unacceptable uses
Beach	Offshore Foreshore Backshore	Tolerant	Intensive recreation No buildings or structures No removal of material
Foredunes	Seaward slope Crest Landward slope	Intolerant	Complete protection of vegetation No uncontrolled passage No building or structures No levelling or breaching No removal of material
First interdune swale	Dry swale Wet swale (swamp)	Slightly tolerant	Limited recreation Limited expendable structures No removal of material or filling
Secondary dune	Windward slope and crest	Intolerant	As for frontal dune
	Leeward slope	Slightly tolerant	Limited expendable structures No removal of material
Second interdune swale	Dry swale Wet swale (swamp)	Moderately tolerant	Limited recreation Limited structures No removal of material or filling
Hind dunes	Windward slopes and crests	Intolerant	As for frontal dune if within zone susceptible to erosion
	Landward slopes and swales	Moderately tolerant	As for secondary dune if within zone susceptible to erosion
Back dune slope		Moderately tolerant or tolerant	Most suitable for development if outside zone susceptible to erosion



The beach itself is tolerant of intensive recreational use, but the foredune is extremely fragile. Destruction of vegetation results from even moderate pedestrian use, or from grazing.

Once even small patches of the foredune lose their vegetation, strong onshore winds can complete the destruction, by producing blowouts initially, then transverse mobile dunes and, finally, a completely unstable dune system which moves inland. Loss of sand from the frontal dune system caused by wind action accelerates the landward movement of the coastline. Natural recovery from damage is slow because environmental conditions are unfavourable for plant growth.

## Secondary and hind dunes

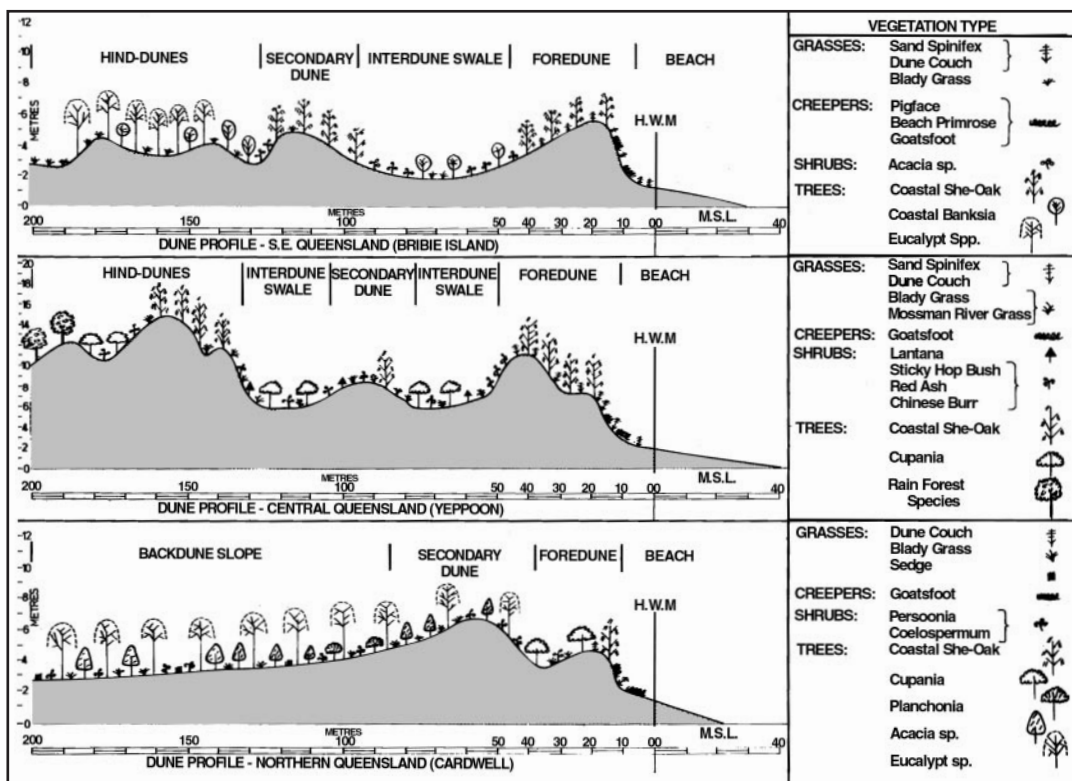
Most other zones of the dune complex are less fragile than the foredunes. However, the exposed seaward slope and crest of the secondary dune and sometimes

the seaward slopes and crests of hind dunes are sensitive to disturbance. These seaward slopes need protection similar to that required on the foredune.

Interdune swales are more tolerant than the foredunes and the exposed sections of the secondary and hind dunes, because the swales are more protected from wind, blowing sand and salt spray, and the nutrient and moisture status of the soils is more favourable for plant growth.

## Use of beach and dunes

The table shows the degree of tolerance of the various beach and dune zones to use and development and lists acceptable and unacceptable uses. Consideration of the tolerance of dune zones to use and development will greatly assist in minimising coastal recession and the cost of damage ensuing when erosion does inevitably occur.



Vehicle access track using a board and chain roadway on the crest and seaward slope of the foredune. This track needs to be fenced to prevent further damage to dune vegetation on each side of the board and chain roadway.