Management guidelines for dune use

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Leaflet No.
V–03.1

Repair of damaged dunes

Why are dunes important?

Vegetated dunes play a vital role in coastal processes. By trapping windblown sand they form barriers that protect hind-dune areas from inundation, salt spray and sand blast. The sand reserves held in dunes replenish beaches that have been eroded by wave attack. Details on coastal sand dune formation and on the importance of dune vegetation can be found in Series II and Series III respectively of the *'Coastal dune management'* leaflets.

How are dunes damaged?

Dunes and their vegetation can be damaged by many natural forces such as waves generated by cyclones and storms, saltwater inundation, strong winds and sandblast, droughts, fires and by insect and parasite attack. Many human-directed activities including grazing, burning, urban development, and pedestrian and vehicular traffic have also contributed to the damage and destruction of vegetated dunes.

Even moderate levels of human activity on beaches can damage the dune and the vital dune vegetation.

What happens if dunes are damaged?

Following damage to the dune vegetation, areas of bare sand are left vulnerable to wind erosion and often develop into blowouts. Further damage can cause large areas of the foredune system to become mobile and move in a landward direction. Sand blown landward from the beach is no longer trapped by dune vegetation and is free to blow inland and be lost to the dune system. The volume of sand retained near the beach decreases and allows storm waves to travel further inland, accelerating rates of beach erosion. The mobile dunes and sand sheets destroy vegetation in their path making more sand available to the process. Large, mobile dunes can cover everything in their path and inflict serious property damage. These processes are described in more detail in Leaflet No.II-04.

Deciding whether to repair damaged dunes

Where dunes have been damaged, either by natural forces or by human activities, and the processes outlined above are occurring, should action be taken to contain or repair the damage? To decide on this issue, the following questions need to be answered.

- What will eventually happen if the damaged dune is not repaired?

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- What damage is being done to property, infrastructure and bushland and what is the cost of this to the local government and the general public?
- How much will it cost to repair the dune?
- What will be the annual maintenance cost?
- Will the benefits gained justify the cost of repair?

Implementing a dune repair program

The following steps are recommended for the development of an effective dune repair program.

1. Identify the cause of the damage and whether it results from natural forces or from human activities.
2. If the cause is due to human activities it is likely to be of an ongoing nature. The possibility of removing or controlling the cause by changing management practices should be investigated.
3. Draw up a detailed dune stabilisation plan that:
   (a) removes or controls the cause of the damage where practicable
   (b) determines the technical requirements (e.g. pedestrian control, use of surface stabilisers, planting and fertilising).
   (c) works out a time schedule. Rapid repair projects may be indicated where highly developed areas are threatened, but a long-term approach to treating the problem will be very much more cost effective.
   (d) investigates sources of finance
   (e) ensures that ongoing maintenance requirements are understood and incorporated, and that progress is periodically inspected and evaluated until the completion of the project.

This damaged dune is allowing sand to be blown landwards, reducing the dune crest height and forming unstable, mobile sand-sheets.