Management guidelines for dune use

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Dune stabilisation of nourished beaches — Noosa project

Introduction

In 1978, an extensive scheme of works designed by the Beach Protection Authority successfully relocated the Noosa River entrance. The works included construction of a groyne, formation of a new beach–dune system and sand nourishment of the existing beach.

Sand placement and pumping associated with the works resulted in the formation of approximately 20 hectares of bare sand consisting of a foredune to prevent wave overwash, and wide, low undulating hind-dune areas. To maintain the height of the foredune and to protect the hind-dune areas, it was necessary to stabilise the bare sand areas against wind erosion. Wind erosion would have reduced the height of the foredune and moved large quantities of sand landward, thus changing the alignment and shape of the dune barrier. Such a weakened foredune would have been more susceptible to over-topping by waves during storm or cyclone conditions, thus placing the project at risk.

Dune stabilisation works

Dune stabilisation works commenced in October 1978 using brush matting and mulch to prevent wind

The new beach and dune at Noosa. Following sand pumping in 1978, an area of 19 hectares of bare sand was revegetated and today supports a healthy growth of trees, shrubs and grass.

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erosion of the bare sand. For the purpose of vegetation establishment, the area was divided into foredune and hind dune areas on the basis of exposure to salt-laden onshore winds.

Sand spinifex grass *(Spinifex sericeus)* was the species best suited to provide ground cover on the exposed foredune. Seed was sown in the bare sand, fertiliser was applied and brush matting was then laid on the seaward slope of the foredune to prevent wind erosion and protect the establishing seedlings. Following successful establishment of sand spinifex grass, horsetail she-oak *(Casuarina equisetifolia)* seedlings were planted on the crest and landward slope of the foredune. This tree species is very wind and salt tolerant and provides a windbreak behind which less tolerant trees and shrubs can be grown. Coastal wattle *(Acacia sophorae)* established well as an understorey shrub on the crest and landward slope of the foredune. Other species planted landward of the foredune crest included coastal tea-tree *(Leptospermum laevigatum)*, coastal banksia *(Banksia integrifolia)*, and paper-barked tea-tree *(Melaleuca quinquenervia)*.

The less exposed hind-dune areas were initially mulched with barley stubble to prevent wind erosion. This stubble was pressed into the sand using the tractor wheels. The area was then sown with sand spinifex grass as a primary stabiliser, supplemented with Rhodes grass *(Chloris gayana)* and green couch grass *(Cynodon dactylon)*. Forage sorghum *(Sorghum vulgare)* was also planted to provide a quick cover of vegetation to aid in sand stabilisation and to provide protection for the establishing native plants. Once initial stability had been achieved, a mix of tree and shrub species was planted, comprised of those species planted on the foredune with the addition of brush box *(Lophostemon confertus)*, pink bloodwood *(Corymbia intermedia)*, blue gum *(Eucalyptus tereticornis)*, Moreton Bay ash *(Corymbia tessellaris)*, tuckeroo *(Cupaniopsis anarcardioides)*, Brisbane black wattle *(Acacia leiocalyx)*, sticky hop bush *(Dodonea viscosa)* and black she-oak *(Casuarina littoralis)*. Some 22,400 tree and shrub seedlings were planted on the dunal areas, the last in January 1980. Information on many of these native dune plants can be found in Series IV leaflets, *'Description of major dune plants'*.

Project benefits

The successful completion of the engineering works and the subsequent stabilisation of the dunal areas with vegetation has stabilised the mouth of the Noosa River and resulted in a major extension to the surfing beach at Noosa Heads. An extensive recreational area has also been created. Continued development of the tree and shrub species in the hind-dune areas is leading to greater species diversity, increased stability and a self-regenerating vegetative cover.

Information gained from this project has been used to plan and assess similar projects in south-east Queensland.