



THE RISKS OF BUILDING ON SAND DUNES

(for assistance to people proposing to
buy or build on sand dune systems)

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1. INTRODUCTION

This document is intended to outline the broad issues and problems where development and sand dunes are concerned.

It should not be regarded as a code or policy of Council but rather as a guide for the building of a house on a sand dune area.

The document is directed principally towards the construction of houses, however, the same issues and problems exist for existing and other forms of development.

2. AIMS AND OBJECTIVES

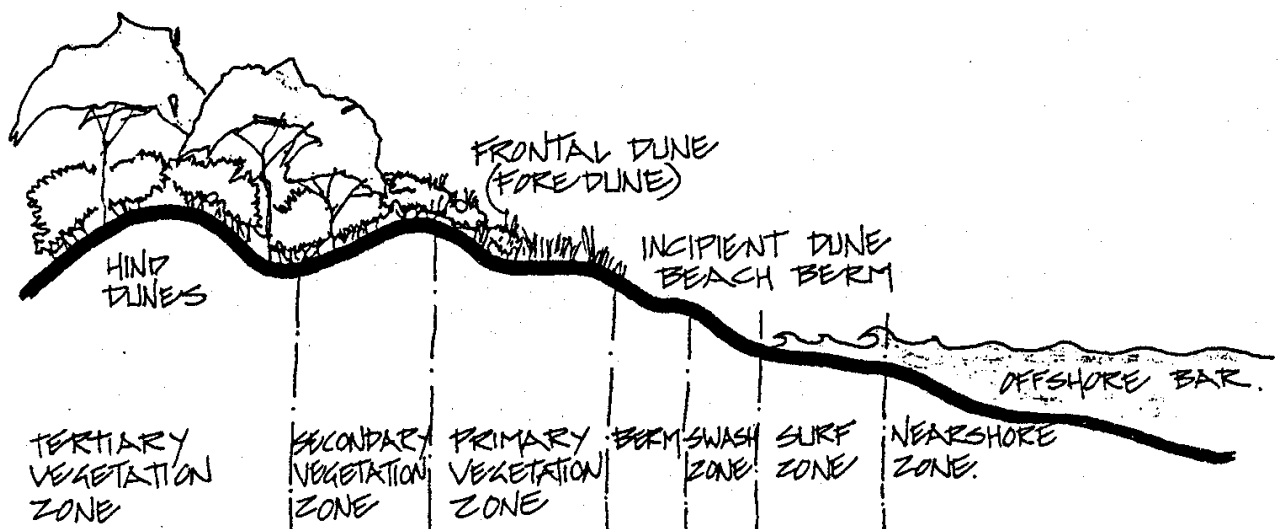
The principal aim of this document is to make people aware of the problems and risks associated with sand dunes and give some guidance on what should be considered prior to making application to Council or purchasing land.

Other specific aims are:

- to outline the importance of sand dune systems to the coastal environment;
- to describe the existing problem areas within the Shoalhaven City and of past events where storm damage occurred.
- to provide detail for the placement of houses on sand dunes;
- to offer advice on the correct management techniques for the short and long term stability of sand dune systems.

3. THE IMPORTANCE AND RISKS OF SAND DUNE SYSTEMS:

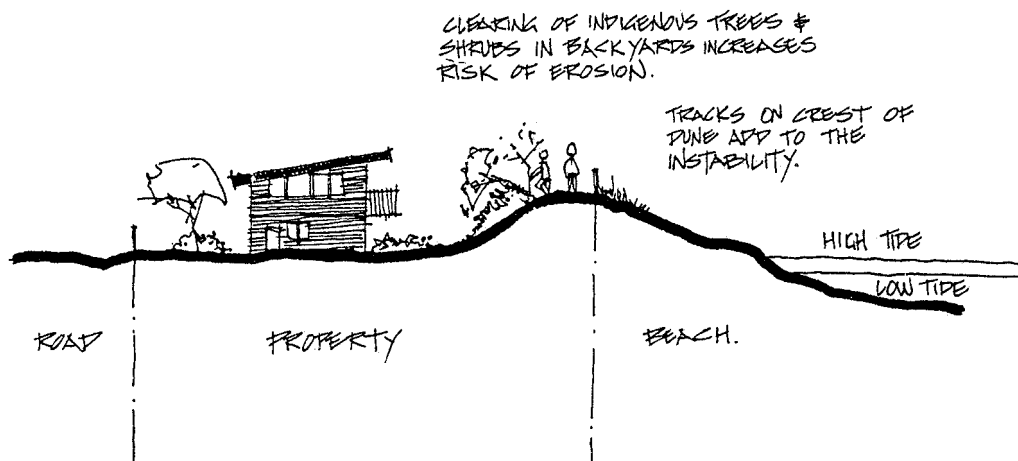
Sand dune systems are nature's buffer strip between the sea and land and they are vital as a defence mechanism against the erosional actions of the sea and the inland drifting of sand caused by wind erosion.



Example of Stable Sand Dune

Sand dunes occur between the beachfront and the stable land behind the beach area and in a number of situations occur on private property.

Human interference with sand dunes by the removal of vegetation and the construction of roads and houses can have a substantial effect on dunal stability.



Removing Vegetation for Views Contributes to Dune Destabilisation

Two major risks exist:

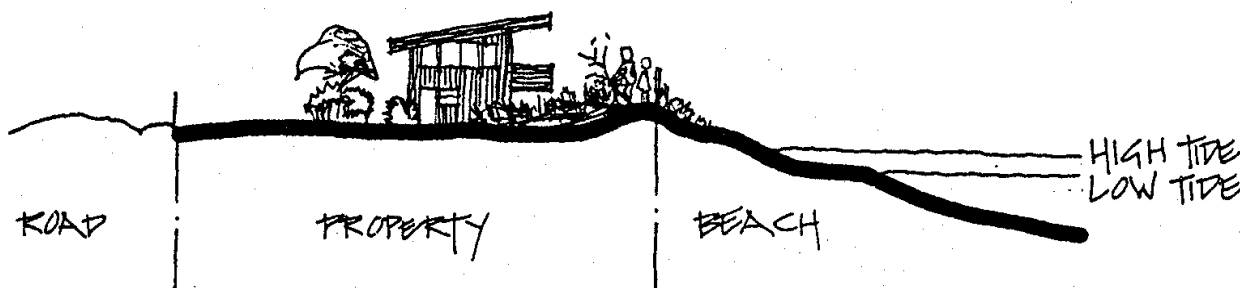
- a. **Stability risk** – is a result of the mobile nature of sand which makes up the sand dune.

The removal of vegetation coupled with exposure to the wind can lead to the erosion of the sand dune, and undermining of the foundations under buildings. Once this action commences, immediate engineering works are required to stabilise the situation to prevent possible collapse of a building.

Vegetation plays a vital role in keeping sand dunes stable by holding the sand together and shielding it from the wind.

- b. **Locational risk** – the close proximity of sand dunes to the sea creates immediate risks in storm situations.

BEFORE STORM



AFTER STORM

(POSSIBLE SITUATION)

HIGH SEAS AND WAVE OVER-TOPPING ERODES FRONTAL DUNES IN SEVERE STORMS

Whether or not a sand dune is stable, it is possible on some exposed beaches for storm waves to attack the dunes and transport the sand out to sea. These situations are mostly beyond human control and houses nearest the frontal dunes are most at risk. Council endeavours to restrict development on dunes within reach of a storm with a 1% probability.

4. RISK STATEMENT:

Due to the risks involved with building on sand dunes, it is strongly advised that should you wish to buy or build on a sand dune then you will be living in a high natural risk area which may be affected by wave or wind erosion resulting in the loss of property and/or buildings. It is strongly advised that you evaluate the possible loss or damage to any development before purchasing or building on sand dunes.

5. SOME PROBLEM AREAS WITHIN THE CITY OF SHAOLHAVEN

There are a number of Identified problem areas within the City of Shoalhaven. This is not a complete list and there are other areas, which are also vulnerable:

Culburra Beach Area

- The Marina, all land fronting the Marina and other land in the vicinity of the frontal dune.
- Eastbourne Avenue, most of the land on the eastern side of Eastbourne Avenue.

Callala Beach

- Quay Road, all land on the seaward side of Quay Road.

Vincentia:

- Part of Elizabeth Drive all land fronting Collingwood Beach.

Mollymook:

- Land on the eastern side of Mitchell Parade.

(See also map on page 7)

The Illawarra Regional Environmental Plan No 1 requires the Council to refer these applications to the Department of Land & Water Conservation and the Department of Public Works for specialist assessment. In these situations, any recommendations of these authorities will be attached as conditions to the Development Consent.

It should be noted that Council may refuse to permit houses to be built or extended in high risk areas depending on the circumstances.

For further information on any of the above areas, contact Council's Development & Environmental Services Group or consult a coastal Engineer.

6. WHAT TO DO WHEN BUILDING ON SAND DUNES:

The following points are the principal actions to follow when making applications to build on sand dunes:

- Consult a Structural Engineer experienced in coastal engineering.
 - Do not clear any vegetation from the site until approved by Council. Illegal removal of vegetation will lead to prosecution under Council's Tree Preservation Order.
 - In any event, clearing of vegetation should be kept to an absolute minimum and consult Council prior to carrying out any work.
 - Replant bare areas with recommended species and gradually remove other vegetation that is not appropriate (bitou bush, asparagus fern, lantana etc). This work should only be done in consultation with the Soil Conservation Service.
 - Site buildings in an area which will have minimal effect on the dune and adjoining properties. Leave sufficient space between the building and the dividing boundary to allow vegetation to assist in stabilising the dune.
 - Limit cut and fill operations and in no case should batters exceed 1:4.
 - Do not reshape the dune unless approved by Council and the Department of Land & Water Conservation.
 - Keep access roads to an absolute minimum and share access ways where
-

- Generally, where the land is the first lot back from the waterfront, Council's Development Control Plan No. 62 *Residential Development in Foreshore Areas* will apply. At Culburra Beach, Development Control Plan No. 48 applies to most foreshore lots.

Apart from the restriction building height, the building should not be the dominant feature on the landscape.

- Consider new and innovative building designs which may be more compatible with the topography and risk. Building designs using pole or demountable construction are suggested.

A DIAGRAM ILLUSTRATING CORRECT METHODS OF BUILDING ON SAND DUNES

Ongoing care:

- The vegetation between houses and the beach (usually within a reserve) is particularly vital for dune stabilisation and care should be taken not to disturb this area. It is desirable for local people to care for this buffer strip.
- Only use pathways set aside by Council for access to the beach. Do not cut your own access as this will destabilise the dune and cause sand to drift inland.
- Continue to care for existing and newly planted vegetation to ensure long term stability of the dune.

Consider being part of a beach care group caring for dune plants. Take a neighbourhood watch approach to vandals or anyone who encroaches on dune paddocks by cutting down vegetation, dumping rubbish and making new tracks and pathways. Contact Council when these situations occur.

PLAN VIEW SHOWING PREFERRED METHODS OF SITING HOUSES

7. FURTHER ADVICE AND ASSISTANCE

The Department of Land & Water conservation (Nowra) is available to assist people in the preparation of management plans and the planting of appropriate vegetation. The Services plant propagation centre may also be able to assist in the supply of appropriate plants.

8. SPECIES RECOMMENDED FOR PLANTING ON SAND DUNES:

<i>Primary/Urgent Care</i>	<i>Secondary Planting</i>	<i>Tertiary Planting</i>
Spinifex sericus (Spinifex Grass)	Letospermum laevigatum (Coast Tea-Tree)	Banksia integrifolia (Coast Banksia)
Ammophila arenaria (Marram Grass)	Westringia fruticosa (Coast Rosemary)	Melaleuca armilaris (Bracelet Honey Myrtle)
Carpobrotus glaucescens (Pigface Creeper)	Acacia sophorae (Coast Wattle)	Eucalyptus botryoides (Southern Mahogany)
Carex pumila (Carex Grass)		

Further information may be obtained from:

Shoalhaven City Council
Development & Environmental Services Group

Department of Land & Water Conservation
64 North Street (PO Box 309)

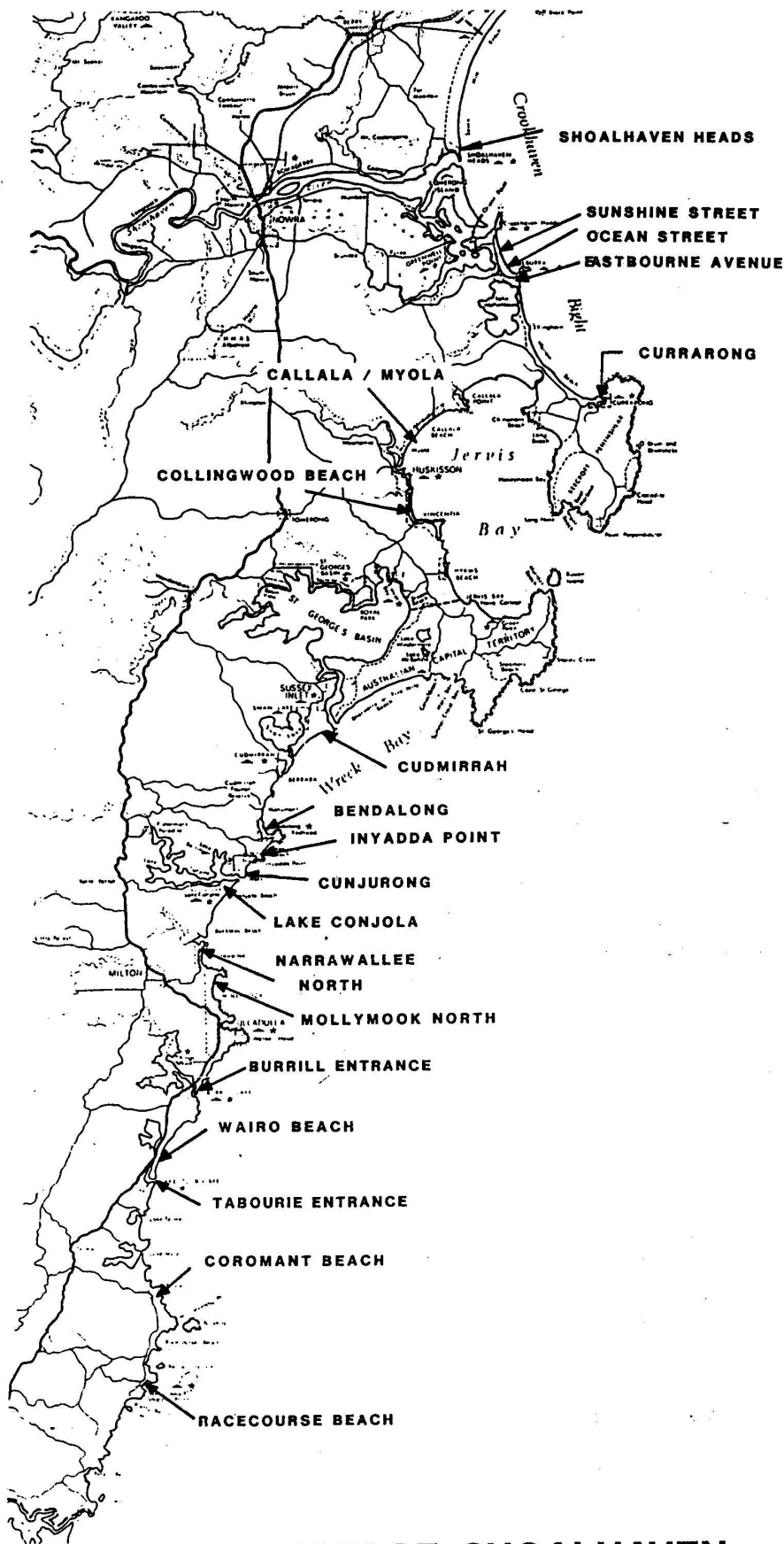
Bridge Road (PO Box 42)
NOWRA NSW

NOWRA NSW 2541

For further information on sand dune systems, the following publications are available:

Coastal Zone Management Study
Culburra, Callala & Collingwood Beaches
September 1975
Posford, Pavry, Sinclair & Knight
Consulting Engineers

Culburra Beach Coastal Engineering Advice
Report No. PWD 8 1009
Public Works Department of NSW



**CITY OF SHOALHAVEN
ACTIVE SAND DUNE AREAS**