

## FOR MORE INFORMATION

You can find out more by contacting any of these organisations:

Coast Care  
Box 4272

Mount Maunganui  
Ph 07 575 0475

Tauranga District Council  
Private Bag  
Tauranga  
Ph 07 577 7000

Environment BOP  
Box 364  
Whakatane  
Ph 07 307 2545

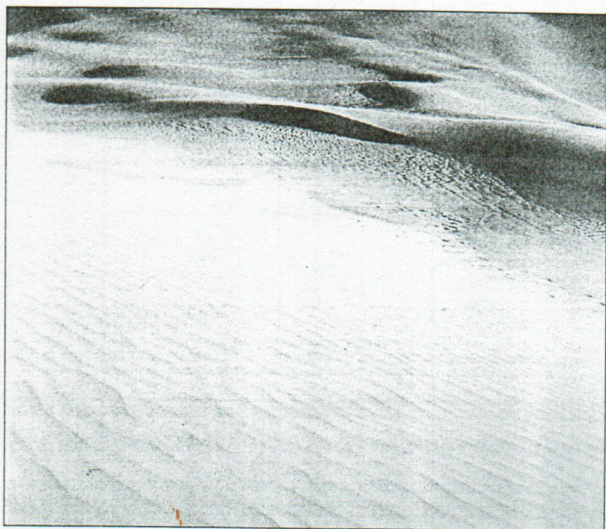
Whakatane District Council  
Private Bag 2001  
Whakatane  
Ph 07 307 9829

or

Department of Conservation offices at:

Tauranga  
Box 1026  
Ph 07 578 7677

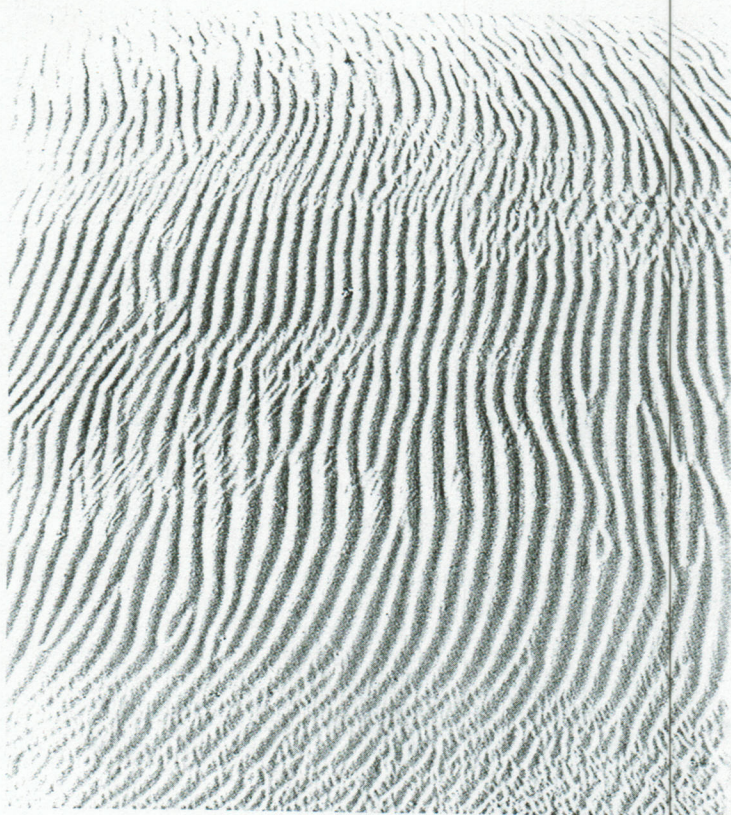
Whakatane  
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## Dune Care in the Bay of Plenty



Department of Conservation  
*Te Papa Atawhai*



## THE SHIFTING SANDS

The Bay of Plenty's sandy beaches in attractive settings provide a wonderful year-round playground. People come to swim, fish, walk, picnic, play, explore - or just admire the view. The coastal environment may look robust enough to absorb all human activities but it's not. Our beach and dune systems are very fragile places, constantly under attack from various kinds of use. The long-term consequences of this use, particularly for sand dunes, can be serious - yet there are easy ways to help protect the dune environment.

## THE IMPORTANCE OF DUNES

Dunes are far more than just hillocks of sand. They may look insignificant but they play a range of very important roles in coastal protection:

- dunes help prevent erosion, even from the most ferocious waves;
- they help protect properties from coastal flooding;
- dunes are home to many native plants and animals, including the threatened New Zealand dotterel;
- they form part of the visual appeal of beaches, known as *natural character*;
- in a healthy state, dunes damaged by storms are able to re-form, as dune vegetation traps wind-blown sand;
- coastal dunes were often settlement areas for early Maori and may contain important cultural or archaeological sites.



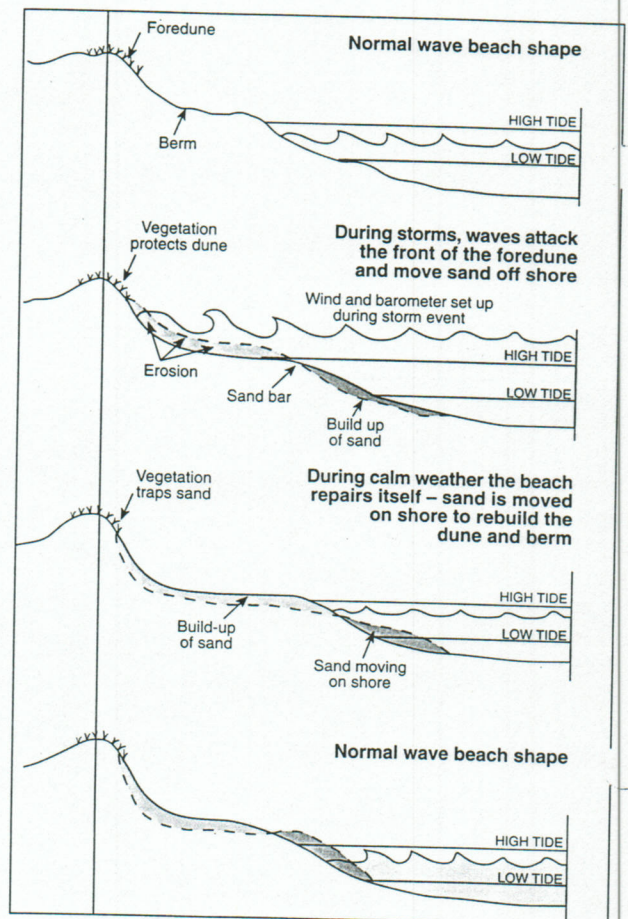
Research into natural processes is an important tool to assist in the protection of dunes.

## HOW SAND DUNES WORK

Sand dunes form on coastlines where:

- there are periods without storm waves;
- there is a sand supply;
- there are onshore winds;
- there are sand-binding plants.

All these factors occur in the Bay of Plenty. Dunes act to protect the land from the sea. During storms sand is eroded from the beach and foredune and shifted offshore. During calm periods sand is gradually moved back onshore to rebuild the dunes. As beach sand dries, it is moved by winds that carry it inland - to be stopped by the sand-binding plants that create dunes.



How the beach changes



## DUNE PLANTS

Plant cover is essential for sand dune stability and growth. These dune dwellers are quite different from those growing in other habitats as they cope with one of New Zealand's most harsh environments. Batterings from salt winds, frequent inundation by sea water, threats of burial by sand, extremes of temperature, low nutrient levels and a limited capacity to hold water are all part of life. While these survivors are usually able to deal with natural pressures, the added stress of human impact can often be too much for them.

Sand-binding plants are especially important on the front face of dunes, where most sand is trapped. There are three main sand-binding plants in the Bay of Plenty. Two natives, spinifex and pingao which are excellent sand trappers; and the introduced marram grass. Within the dunes there is a



*Pingao*, *Desmoschoenus spiralis*.

variety of other plants adapted to the harsh, sandy conditions. Native species include sand convulvulus, pohuehue, sand coprosma and *Austrofestuca littoralis* - most common on parts of Matakana Island. Other introduced plants commonly found include lupin and ice plant.

Spinifex and pingao are preferred species for dune stability. While marram grass does an excellent sand binding job, it can take over native species on foredunes and tends to create steeper foredunes, increasing the likelihood of blow-outs - its use in the Bay of Plenty isn't encouraged. On the other hand, much of the pingao once found in New Zealand has disappeared because of dune damage, so its use as a sand binder is actively promoted.

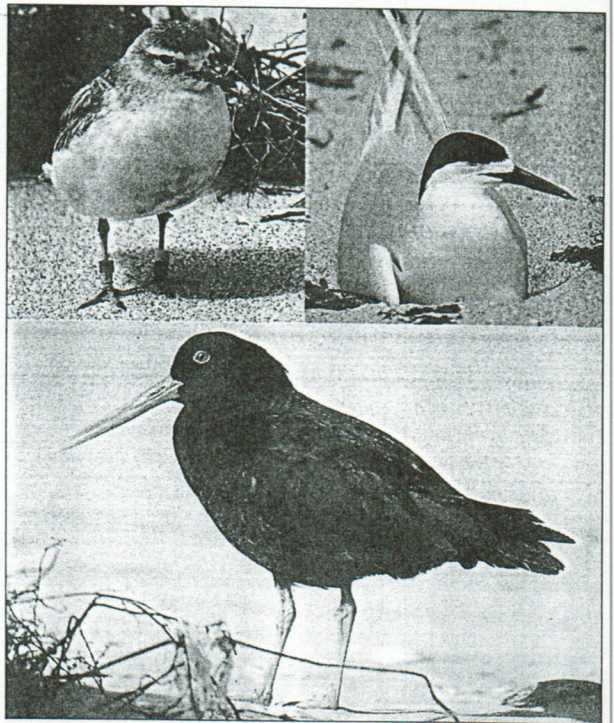
Not surprisingly, the dunes behind the foredunes are called back dunes. Although these are reasonably stable, they can be damaged by human impact and invasive weeds such as brush wattle, boxthorn and bone seed.

## DUNE INHABITANTS

Nature didn't design well for the protection of dune-dwelling birds. Typically their nests are shallow and "built" in open, poorly protected places. Accidental damage is easily caused by visitors unaware of birds' nesting characteristics, but deliberate damage is also known around the Bay of Plenty.

Birds most commonly found in the Bay's dunes are the NZ dotterel (the region's most endangered bird); variable oystercatcher; Caspian and white-fronted terns; red billed and black billed gulls, and the less common banded dotterel.

NZ dotterels lay eggs from mid September to mid January in nests so shallow they may be barely noticeable. Often these are beside a landmark such as a plant or piece of driftwood, usually isolated from other nests. Nesting birds fly or run noisily at intruders or feign injury. Banded dotterels lay between August and December in slightly deeper nests, sited in the open. They too feign injury if threatened. Variable oystercatchers prefer nest sites with a good view such as on



*NZ dotterel* (top left), *white-fronted tern* (top right) and *variable oystercatcher* (bottom). Photos: D Wills.



sandy ridges, sometimes in light plant cover. These are scrape-type nests either unlined or lined with shells, twigs or small stones. Egg laying extends from October to February. The white-fronted tern nest is equally hard to detect - merely a depression found in sand or among plants. The birds breed from late October to February and are easily disturbed by summer beach visitors. Caspian terns lay from September to November - again, in a shallow, unlined hollow in sand or shingle. Their nests are usually on sandy beaches and spits often exposed to the open sea and close to high tide mark. Birds are not the only animals living in dunes. Other inhabitants are the mostly nocturnal scarab beetle, seashore earwig, sandhoppers, sand lice and the infamous katipo spider. In addition the Common Copper butterfly and Little Blue butterfly can often be seen in sand dunes. At one time New Zealand's shortest lived snail, the dune snail, could also be found on several Bay of Plenty beaches. However, loss of habitat from fires, development, vehicles and unsuitable introduced plants has been so severe the snail is only found today at a few beaches in Northland.

#### HUMAN IMPACTS

Some human activities damage dunes and their inhabitants more than others. The main problems are:

- creating personal tracks across dunes to reach the beach;
- riding motorbikes, four wheel drives and other vehicles on dunes;
- riding horses on dunes;
- allowing stock to graze dune areas;
- dragging boats across dunes to launch from the beach, rather than using local ramps;
- walking directly up or down dune faces;
- fires;
- planting exotic and invasive plants;
- disturbing native birds and nest sites;
- uncontrolled dogs.

These activities disrupt dune vegetation and wildlife and affect dune structure. Ultimately they contribute to erosion and flooding and help destroy the natural character of the Bay's great beaches.

Other damage is caused by predators such as stoats which kill coastal birds and eat their eggs. Rabbits also eat young plants and add to erosion by digging burrows.

#### YOU CAN HELP!

There are simple steps all beach users can take to help protect sand dunes. Apart from avoiding the most damaging activities, you should also:

- generally keep off the fore dunes;
- use established accessways wherever possible;
- avoid bare or thinly vegetated areas of sand;
- encourage children to play in areas other than dunes;
- find out about bird nesting sites around the coast and promote protection;
- join a coast care group or seek similar advice for individual action.

Beach and coast care groups work to rehabilitate dunes by rebuilding, planting, fencing, maintenance and providing further education on dune protection.

**Rebuilding** may be undertaken by constructing fences to rebuild small areas through sand trapping.

**Planting** using mainly native species, especially spinifex and pingao, following natural plant distribution patterns. Appropriate planting allows sand reserves to build up and encourages other plants to grow. In some areas fertiliser may be applied to existing plants.

**Fencing and accessways** direct users to the beach without disturbing the vegetation and provide protection for new plants.

**Maintenance** is required because dunes are constantly changing and moving. The stability achieved is wasted if dunes are neglected. Community groups play an important role in ongoing maintenance for dune protection.

