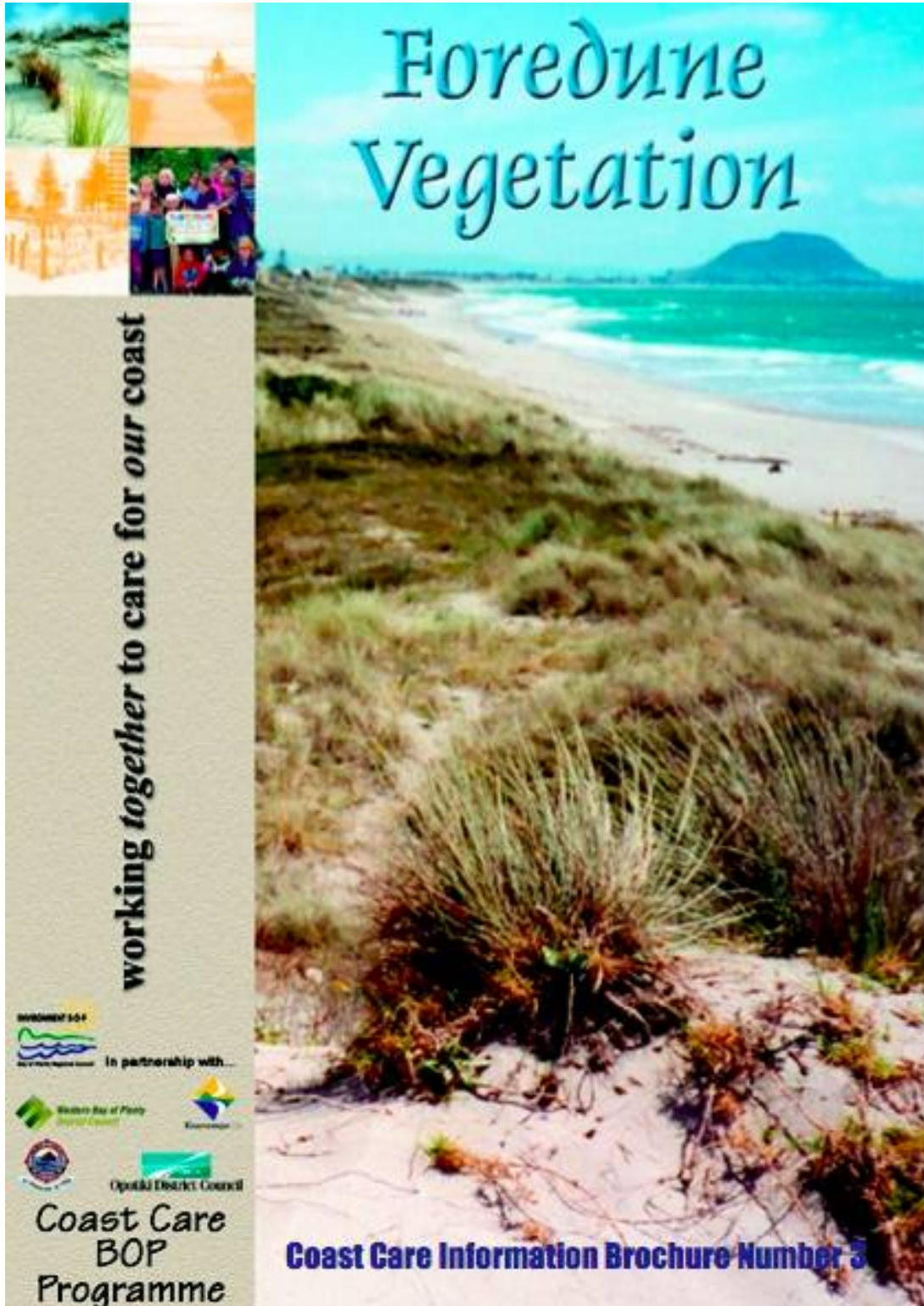


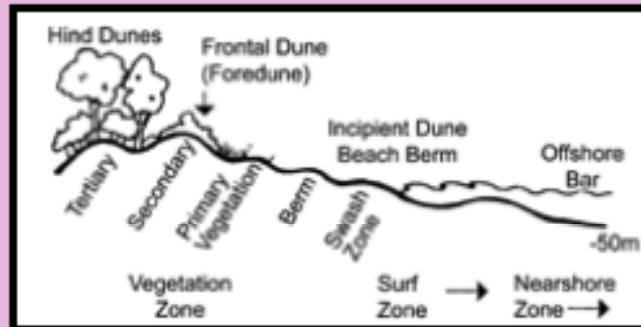
ANNEX 4 ▶ Example of Coastal Care Information



Vegetation plays an important part in the formation and stabilisation of coastal sand dunes.

Large areas of our coastal foredunes have been modified by residential development, recreational activities, farming practices and beach mining. These disturbances have led to a change in the dune stability, often resulting in vegetation loss and wind erosion.

Introduced plant species have been planted to try to stabilise these areas and in some areas these have displaced native species. To date, no introduced plants have been found to provide equal or better protection than the native dune plants. The superior function of native dune plants is the principle practical reason for their exclusive use by Coast Care groups in the Bay of Plenty Region.



Recently, there have been some attempts to restore the natural coastal vegetation on sand dunes. The Resource Management Act (1991) places an obligation on land managers to protect and preserve the natural character of the coastal environment, including areas of native vegetation.

Pioneer foredune plants, spinifex (*Spinifex sericeus*) and pingao (*Desmoschoenus spiralis*), trap wind blown sand in the frontal dune. This sand serves as a reservoir for the beach during periods of wave erosion. If sand-trapping dune vegetation is not present, wind-blown sand from the beach moves inland and is lost from the beach/dune system.

The above-ground parts of these dune plants act as filters, causing a reduction in the surface speed of sand carrying wind. This reduction in wind energy results in the deposition of sand on and around these plants, to naturally rebuild dunes after wave attack.

Spinifex and pingao have the ability to grow through accumulations of wind blown sand. Cycles of sand deposition and plant growth result in dune formation and buildup.

Secondary vegetation zone plants, may cover the crest of the foredune and extend inland to include the secondary dune. They can gradually replace the foredune plants where soil conditions improve and habitat conditions become less hard (e.g. decreased exposure to salt spray and sand blast).

Where these plants form a dense cover, the dunes are well stabilised.

Coastal forest or tertiary zone vegetation, is composed of trees and shrubs, and represents the climax or mature state of natural coastal vegetation. (This forest zone has disappeared from nearly all of New Zealand's coastal dunes due to land development).

Many of the coastal forests species can tolerate growing in the secondary vegetation zone, but are in shrub form or stunted, due to excessive exposure to strong winds and salt spray.

Dune Vegetation Can ✓	Dune Vegetation Cannot ✗
<p>Prevent Wind Erosion by decreasing wind speed at ground level</p> <p>Build Up Sand Dunes and thus Reduce The Extent Of Erosion During Storms</p> <p>Reduce Wave Erosion Caused By Overwash - where dune management allows.</p> <p>Tolerate Hostile Environment - of high winds, salt spray, sand blast, covering by sand, sandy soil and little water.</p> <p>Accept Massive Movements Of The Dunes both vertically and horizontally.</p>	<p>Prevent Direct Wave Erosion - dune sand is not strongly bound by plant roots under heavy wave attack</p> <p>Tolerate Excessive Physical Damage - caused by people, stock or vehicles</p> <p>Tolerate Mismanagement such as: - Mowing: which destroys some species!</p> <p>Tolerate Topsoiling: which prevents free drainage and is unsuitable for growth of many native dune species.</p> <p>Tolerate Introduction Of Unsuitable Plant Species: some undesirable plants shade-out and displace natural vegetation.</p>

Foredune Primary Zone	Sand Secondary Zone	Coastal Forest Teritary Zone
Pingao <i>Desmoschoenus spiralis</i> Spinifex (Kowhangatara) <i>Spinifex sericeus</i> Sand fescue (Hinarepe) <i>Austrofestuca littoralis</i> Beach spurge (Waiu-a-kahukura) <i>Euphorbia glauca</i> Sand convolvulus (Nihinihi) <i>Calystegia soldanella</i> NZ Ice Plant (Horokaka) <i>Disphyma australe</i>	Pohuehue <i>Muehlenbeckia complexa</i> Sand Coprosma <i>Coprosma acerosa</i> Carex <i>Carex testacea</i> Tauhinu, cottonwood <i>Cassinia leptophylla</i> Harakeke, flax <i>Phormium tenax</i> Ti kouka, Cabbage Tree <i>Cordyline australis</i> Toe toe <i>Cortaderia toe toe</i> Taupata <i>Coprosma repens</i> Haupara, Coastal Fivefinger <i>Pseudopanax lessonii</i>	Pohutukawa <i>Metrosideros excelsa</i> Karo <i>Pittosporum crassifolium</i> Kohuhu <i>Pittosporum tenuifolium</i> Ngaio <i>Myoporum laetum</i> Puriri <i>Vitex lucens</i> Akeake <i>Dodonea viscosa</i> Kanuka <i>Kunzea ericoides</i> Karamu <i>Coprosma robusta</i> Manuka <i>Leptospermum scoparium</i> Hebe species Ti kouka, Cabbage Tree <i>Cordyline australis</i> Haupara, Coastal Fivefinger <i>Pseudopanax lessonii</i>
<p>This list has been compiled with the assistance of Forest Research and local nurseries.</p>		

Other Titles in this Series Are

- No. 1 Bay of Plenty Coast Care
- No. 2 Formation and Functions of Beaches and Sand Dunes
- No. 4 Dune Usage
- No. 5 Coastal Plants - Pingao
- No. 6 Coastal Plants - Spinifex



Bay of Plenty Regional Council

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For further information on Coast Care groups and programmes contact your local District Council or Environment B-O-P's Coast Care Coordinator.
 Phone: 0800 ENVBOP (368 267)
 0800 ENVFAX (368 329)