View over sand dunes and spinifex grass, Karekare Beach, near Auckland. Beate, Flickr

COASTAL CARE

Nearly 90% of New Zealand's sand dunes have been destroyed, but they can be restored if we work with nature. **Ann Graeme.**

We humans like to think we are in charge on planet Earth. We are mistaken. Now, as climate change threatens to change our world and our lives, we are coming to realise that we need to work with nature, not against it. Nowhere is this better shown than in our attitude to the coast.

We used to try to control the sea with walls. Walls are ugly and expensive, they block access, and they are increasingly useless in the face of rising sea levels and bigger and more frequent storms. In the long term, it is inevitable that the land will retreat, and so must we.

But in the short term, in the coming months and years, we can delay the sea's advance by restoring nature's natural defences – the sand dunes. This is the best, most effective, and cheapest way to buy time on the beaches.

And restoring the sand dunes and the fore-dune community buys us more than just a shield from the sea. It recreates a beautiful ecosystem of unique plants and animals, an ecosystem that is currently seriously endangered.

Almost 90% of New Zealand's sand dunes have been destroyed. What is left, about 21,300ha, has been damaged and depleted. Dunes have been burnt, grazed by stock, nibbled by rabbits, obliterated by bulldozers, trampled underfoot, and crushed by vehicles.

In many places, we have forgotten that they ever existed.

Thirty years ago, the beach front at Mount Maunganui was a bank covered in African kikuyu grass. It eroded in every storm and sand blew across Marine Parade and into the houses.

Then, in 1996, when dune restoration was in its infancy, the Bay of Plenty Regional Council organised a dune planting by Coast Care volunteers.

Today, the same beachfront is unrecognisable. As the plants trap the blowing sand, the carpet of golden pīngao and silvery spinifex or kōwhangatara has advanced down the beach. Walkways provide access to the sand and sea.

In this garden by the sea lives a community of native insects, lizards, and spiders. The plants are a refuge for dotterel chicks when black-back gulls wheel overhead or variable oyster catchers menace their smaller neighbours.

This is the essence of working with nature. It shows what can and should be achieved on vulnerable beaches all around the country. For too long, we have neglected and misused the sand dunes. Now it is time to restore them, both for their own sake and for ours.

BEFORE: Coast Care Volunteers restoring the sand dunes at Mount Maunganui in 1996. Coast Care, Bay of Plenty Regional Council

AFTER: The same stretch of beachfront in 2020. Ann Graeme

Coastline kings

Two native plants dominate the sand dunes. They are pīngao, the golden sedge, and kōwhangatara or spinifex. Few plants could survive their life on the sand dunes. It's hot and dry, there is no shade, and the wind carries sand and salt-laden spray. The shifting sand offers little anchorage or nutrients. But pīngao and spinifex thrive in these conditions. The golden leaves of pīngao are tough and waxed to withstand the sun. Spinifex's narrow leaves are covered with silvery hairs, which reduce water loss. Both can survive being buried in sand and drenched with saltwater. Sometimes, a storm will drag sand from beneath the pīngao's roots, but soon new runners will snake out and bind the wounded dunes. The waves will dump sand and bury the spinifex, but within weeks it will emerge. It is this capacity to trap new sand that can build and extend the dune and give it greater resilience and stability.

Pīngao (*Ficinia spiralis*, golden sand sedge), at Tauperikaka Point, West Coast, New Zealand.

How to restore a sand dune

Three elements are needed – the place, the plants, and the people.

The place: Restoration must begin on a clean site. It may seem perverse, but pīngao and spinifex, which can grow in such harsh conditions, cannot cope with competition. Soil and weeds must go. Sometimes even a bulldozer – that dreaded machine that has destroyed so many dunes – can be used to bury the accumulated dirt and weeds, cover it with sand, and recontour a dune.

Forest & Bird volunteers removing lupin seedlings from a Catlins beach in 1990. Fergus Sutherland

The plants: Over the decades, better and better planting techniques have been worked out, and the rate of successful plantings has increased. Even so, in the first years, newly planted dunes are particularly vulnerable, and an entire planting may be lost to storm or drought or rabbits. Dune restoration needs perseverance.

The people: Volunteers are the backbone of dune restoration work. While regional councils do the planning, prepare the site, and source the plants, it is volunteers who plant and tend them. Equally important, it is the volunteers who are the minders, learning about the dunes, enjoying the beauty and the protection they provide, and spreading the word, educating beach goers and encouraging more Coast Care groups to tend long-neglected beaches.

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