Life's a Beach
A Coastal Education Resource Kit

5a The past – how people have affected New Zealand beaches

Exploring positive and negative impacts on dune systems

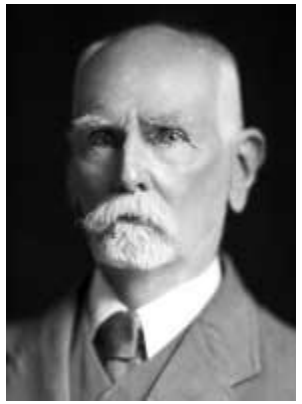
Working together to care for our coast – Kia ngatahi te tiaki takutai

Objectives for today

- Today we will look at the past
  - How modified are New Zealand dune systems?
  - What activities have we done over time that have modified New Zealand beaches?
  - How have past activities impacted on our beaches?
  - How did we respond to erosion of beaches in the past?
  - How do past responses differ to the current Coast Care response to beach erosion used now?

What were the sand dunes like before humans came to Aotearoa?

"It is not altogether easy to present a picture of the virgin dunes of New Zealand… (as) there are few places where man, his fires, and his grazing animals have not wrought great changes"



(From a report on the dune areas of New Zealand. Dr. L. Cockayne 1911)

Is this sand dune natural?

- That depends on what you call ‘natural’.
- The sand dunes we see today have all been modified by human activity in some way.

To what extent were dunes modified?

- In pre human times there were 12,000 ha of coastal dune vegetation.
- Today there are only 3,000 ha left and much of this has been highly modified.

Dune clearance

- Early Polynesian settlers burnt coastal forests to provide wide ocean vistas.
- This enabled them to have a clear view of pending attacks by waka borne adversaries.

Image: Northern Kaipara Dune Erosion

Dune clearance

Dune bulldozing – Mount Maunganui dunes being bulldozed in 1920s. Practices such as dune bulldozing were done for development and improved views.

Grazing and Stock Droving

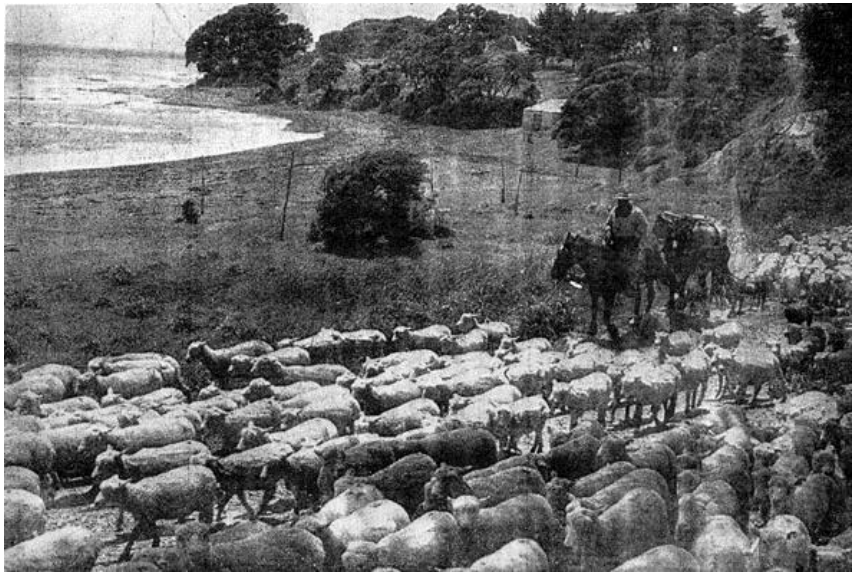


Image: Stock droving near Te Kaha

- In early time the beaches were the easiest way to move stock
- Many dune plants were destroyed by grazing.
- Stock droving on beaches continued in the eastern Bay of Plenty until 1990s.
- Consequently, many native dune species are now extinct in the Ōpōtiki District.

Vehicles on sand dunes

- Vehicles driven on sand dunes:
  - Destroy dune vegetation.
  - Make dunes less stable.
  - Increase dune vulnerability to storm damage.
  - Destroy native bird nests and eggs.
- Councils throughout the Bay of Plenty are working to reduce the impacts of vehicles on dunes

Rabbits

Image shows rabbit grazed pīngao – Pāpāmoa

- Rabbits eat dune plants, and can prevent regeneration of many speies such as pīngao and taupata
- Dune vegetation scientist Dr David Bergin says rabbit control is the single most important activity to protect dune plants (assuming stock, vehicles etc under control
- Rabbit numbers are assessed each year, and where damage to plants is found they are controlled

Sewerage and stormwater outlets

- Stormwater erodes sand.
- Stormwater creates saturated and compacted sand which does not absorb as much wave energy.

Introduced plants

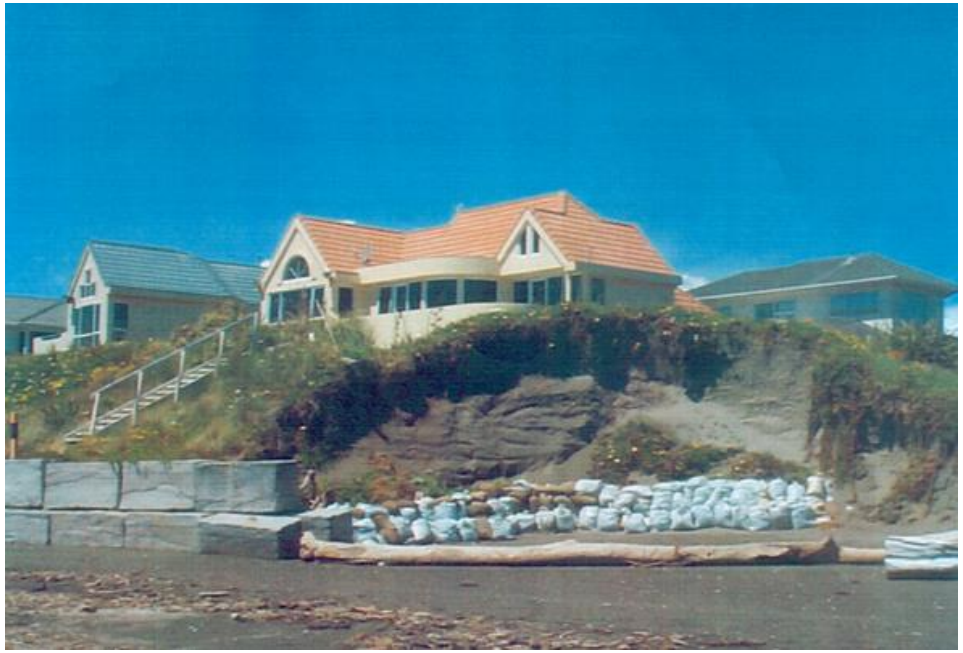
Mount Maunganui wattle clearance 1994

- Many weeds have invaded or been introduced to the dunes
- For example, Agapanthus, Kikuyu grass, Buffalo grass, South African ice plant, boxthorn and Sydney golden wattle (there are many more)
- These weeds can dominate natural areas and change their character
- This also changes the habitat for native animals, and can remove vital resources

Hard structures – early responses to erosion problems at Raumati Beach

Images: Raumati Beach

Hard structures – early responses to erosion problems on the Kapiti Coast



Kapiti Coast 2001

More recently kōwhangatara has been planted and the dunes have now overgrown the hard structures put there to prevent erosion

Dunes were regarded as wastelands!

Image: Ōhope Beach

- Many dunes, in a state of severe neglect, were regarded as wastelands.
- Dunes were (and still are) being used as dumping grounds for household garbage, weed infested garden waste, broken concrete, and parking areas inappropriately located.

Erosion

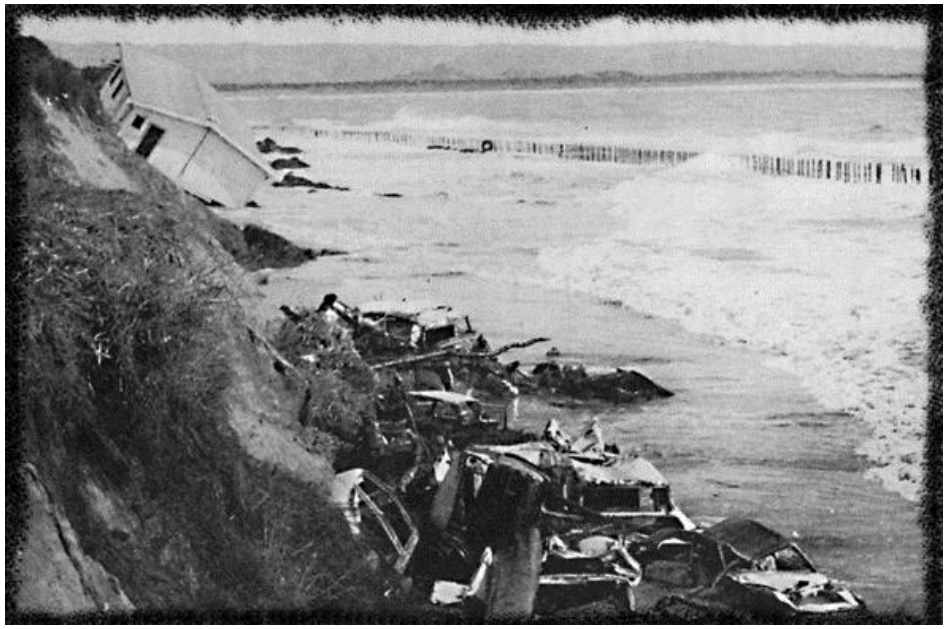


Image: Ōhiwa 1976

- Erosion is a natural coastal process that operates in cycles
- Coastal erosion is only a problem when we build or develop too close to the coast
- Removing dune vegetation can make erosion more severe

Waihī Beach Coast Care – North End project

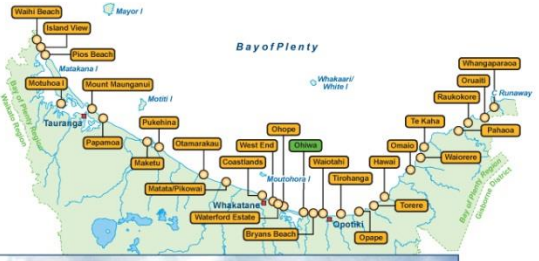
August 1995, North End

October 1995, Waihī Beach Coast Care volunteers planting to restore the dune

January 2004, The native dune plants are flourishing and trapping sand on the new protective dune and developing a wider, white-sand beach. Natural protection and human amenity have both been restored.

Erosion problems and early responses

Ohiwa Coast Care



Ohiwa 1976 - Gazetted as ‘Stock Reserve’ in 1906

Ohiwa 1996

Wave action returned the sand during calm weather and due to changing weather cycles. This sand was then trapped and stored by native dune plants to rebuild the restored dune system.

Dunes are a dynamic natural system of balance. However the balance was tipped to favour erosion by changing weather patterns, in combination with the almost **total** removal of the native “sand binding” plants.

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Tiaki takutai

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Environment Bay of Plenty in partnership with Tauranga City Council; Whakatane, Western Bay of Plenty, and Opotiki District Councils; and the Department of Conservation.

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The Coast Care response - Pāpāmoa Domain

Pāpāmoa Domain carpark 1995

2011 after Coast Care Volunteers fenced and replanted the dunes

The Coast Care response

Marine Parade, Mount Maunganui

The problem

Destruction of native sand binding plants by dune bulldozing in 1965 and subsequent and poor management of pedestrian use. Repeated wind erosion of dune dominated by kikuyu and ice plant.

The Coast Care response

The effect

Sand blowing up and being deposited on the road, which was blocked for three days. Sand is being lost from the active beach system. Removal to re-open the road cost about $10,000.

Restoration project

Mount Maunganui Coast Care decided that kikuyu and ice plant must be replaced by native sand binding species. Bollards and ropes are being used to protect the planting and mark the formed accessways.

Project result

The sand no longer reaches the road. Instead, it is now trapped in the leading 4-5m of dune plants. Bollards and ropes have been moved seaward to protect advancing plant growth.

The problem - July 1995

The effect – June 1996

Restoration project - June 2002

Project result - July 2004

The current situation

Restored dunes improve many natural beach values:

- Enhanced dune function, especially sand trapping after storms when cross-shore sand exchange is particularly active.
- Improved dune resilience and buffer function.
- Often an improvement to beach width and biodiversity.

Bay of Plenty
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