

# *Pimelea arenaria*: a sand dune species in decline.

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## Introduction

*Pimelea arenaria* is an attractive, low-growing, native species that grows on sand dunes, and is distributed mainly in the North Island. Concerns have been expressed about population decline, and at some beaches it has become locally extinct, e.g., Taipa (Northland), Piha (Auckland), and Lyall Bay, Palliser Bay, Petone, Plimmerton, Waikanae, and Red Rocks (all in the Wellington region). It is classified as 'declining' in the latest NZ threatened plant lists. This study investigates *Pimelea arenaria* population structure, abundance, and reproduction.



## *Pimelea arenaria* Cunn.

<b>Status:</b>	endemic.
<b>Common names:</b>	sand daphne, autetaranga.
<b>Habit:</b>	low growing, up to 2 m or more across.
<b>Conservation status:</b>	'declining'.
<b>Habitat:</b>	sand dunes and dune hollows.
<b>Phenology:</b>	clusters of small, white flowers at stem apex.
<b>Sex life:</b>	gynodioecious (separate female and hermaphrodite plants).

It is one of a small suite of about 14 native plants of sand dunes including, spinifex, pingao, *Oxalis rubens*, shore bindweed, tauhinu, sand coprosma, *Carex testacea*, knobby clubrush, and pohuehue.



## Objectives

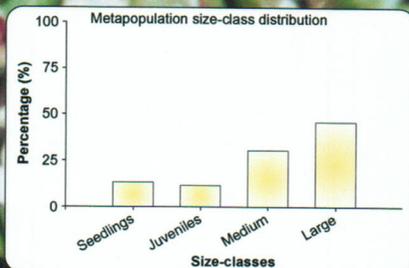
- ⊗ Determine population size at a number of locations.
- ⊗ Establish population size-classes and gender structure.
- ⊗ Investigate reproductive strategies.
- ⊗ Determine threats.

## Methods

- ⊗ 22 populations throughout the North Island were surveyed.
- ⊗ Pollinator exclusion trials were undertaken on plants at three sites on the Coromandel Peninsula.
- ⊗ Associated plant species and habitat characteristics were recorded.

## Results

- ⊗ Population size varied from 4 to hundreds of individuals.
- ⊗ Most populations were dominated by larger (older) individuals. There were few seedlings or juvenile plants.
- ⊗ At some sites, most individuals were 'unhealthy' looking, i.e., there was die-back of the centre of the plant, and dead stems were present.
- ⊗ Known plants have survived more than 40 years.
- ⊗ Plant health appears to benefit from replenishment by wind blown sand.
- ⊗ Flowering occurs in cyclic pulses in the flowering season; i.e. flowering, new growth, etc.
- ⊗ Fertilisation success was high at most sites.
- ⊗ Ovule maturation after fertilisation is rapid; one month from flowering to a ripe fruit.
- ⊗ A medium sized plant has the potential to produce many hundreds of flowers/fruit each summer.
- ⊗ At most beaches the number of exotic plant species greatly outnumbered natives.



## Threats

- ⊗ Habitat modification: developed for roads and housing or converted to pasture or pine plantation.
- ⊗ Invasion by exotic species:
  - deliberate plantings
    - dune stabilisation, e.g. marram
    - beautification, e.g. ice plant, gazania, lily
    - nitrification, e.g. tree lupin
  - naturalisation, e.g. pampas, pine spp. hare's tail.



## Conclusions

- ⊗ Tall and aggressive exotic species such as pampas, tree lupin, and marram are likely to contribute to decline of *Pimelea arenaria* in the future, by overtopping, outcompeting, and displacing.
- ⊗ Although seed is produced abundantly, recruitment of seedlings is rare at most sites surveyed.
- ⊗ In the long term, some *P. arenaria* populations will not be able to replace themselves naturally, and would require active management for long-term population survival.

## Acknowledgements

This research was funded by the Foundation for Research, Science and Technology under contract number CO9X0004. Thanks to Environment Waikato, Department of Conservation, Edna Leet, Bob Abercrombe, Bruce Burns, Bill Lee, AK, WAIK, CHR. Poster design by David W. F. Hunter, Landcare Research, Hamilton.