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WAY OUT WEST

Dune Restoration of NZ Annual Conference 2014

11 – 13th March 2014

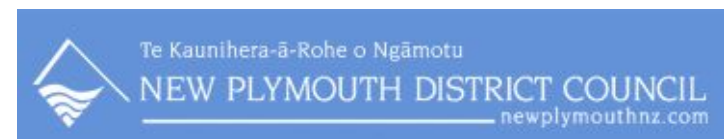
Fitzroy Surf and Lifesaving Club, New Plymouth



Presentation: Australian wattle regeneration habits on the rear dunes

Graham Pearson, Castlecliff Coast Care
pearsongandl@clear.net.nz

Conference sponsors



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Australian wattle regeneration habits on the rear dunes Castlecliff Coast Care Graham Pearson

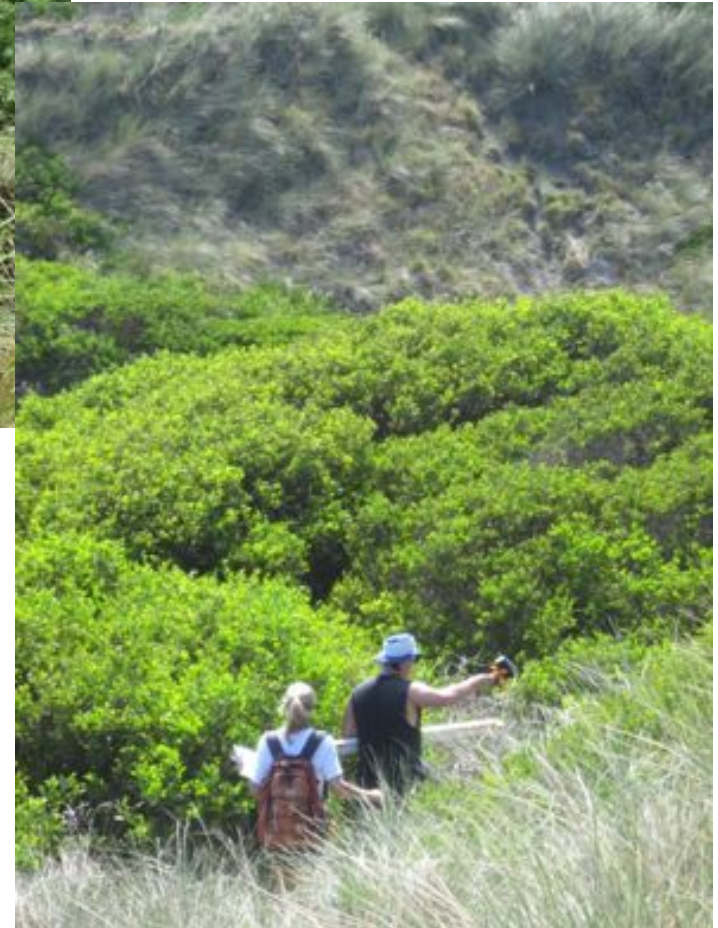


Elliot Kramer, and Katherine Schneller



Large rolling sand dunes
Fore-dunes = Spinifex meadows, Pingao,
Rear dunes = Marram & Australian Wattle,
weeds !

Earlham
student's
2012 project





No other trees!

A Karo gets through



Stumps don't re-grow



Poorly cut out, spreading Wattle will
re-grow



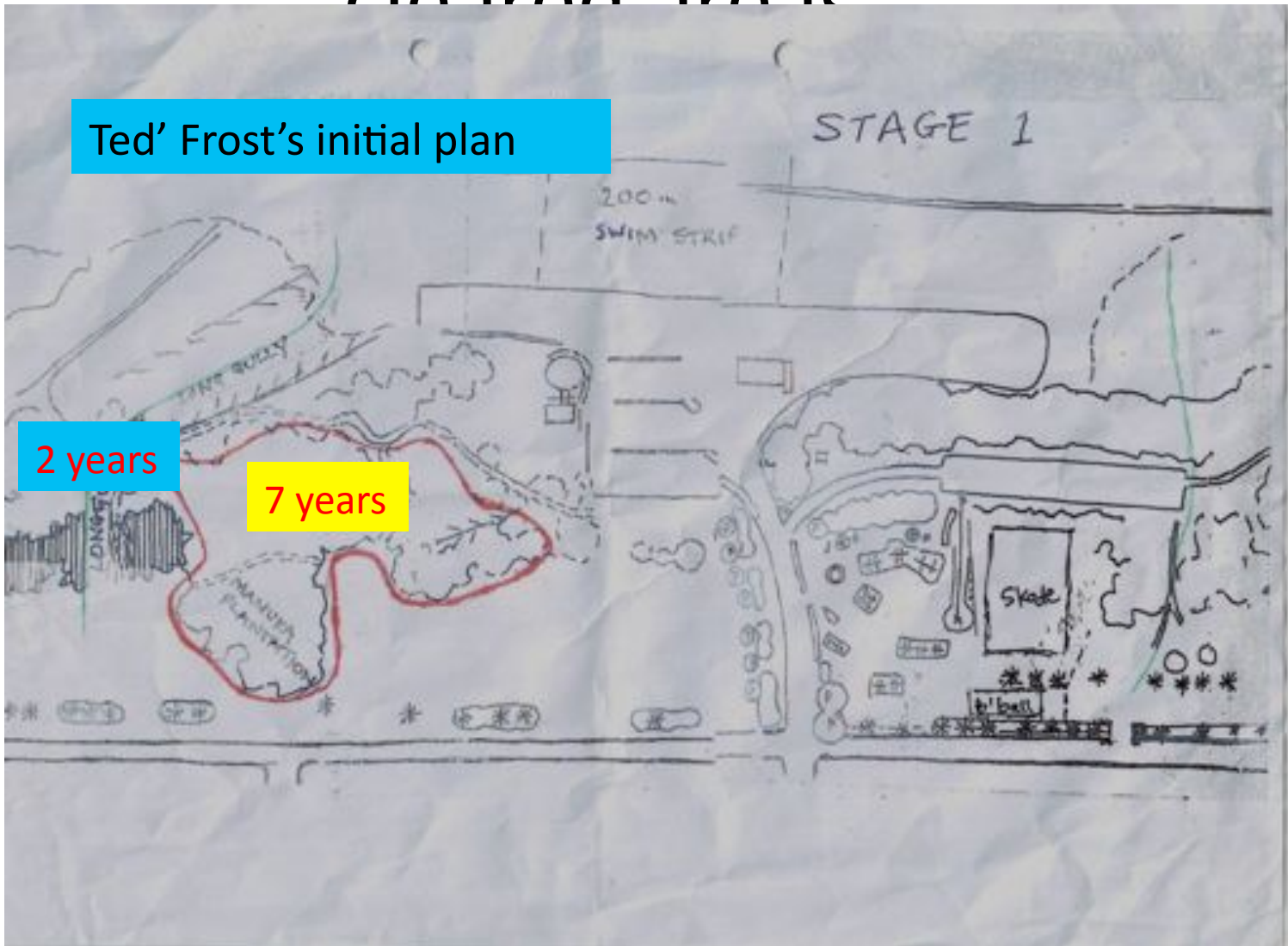
Generally little re-growth
(clearing done well by Ted & PD workers)



Possible research topics 2013 ?

- Spread & age of Wattle since planted (in rows?) to stabilise sand dunes
- What native plants, and where do they grow through the Wattle cover
- Wattle seed survival & viability
- Wattle re-establishment after clearing

Castlecliff Coast Care cleared areas





Students initial research



Photo Colin Ogle
Elaiosome
Sticky & ant food ?

Acacia longifolia, a close relative of *A. sophorae*, can shed up to 16,000 seeds in a single season.

Up to 60% of these seeds show intrinsic dormancy

Thus a substantial seed bank can form over a relatively short period of time (Marchante *et al.* 2010). **Do we have one at Castlecliff ?**



What we did!



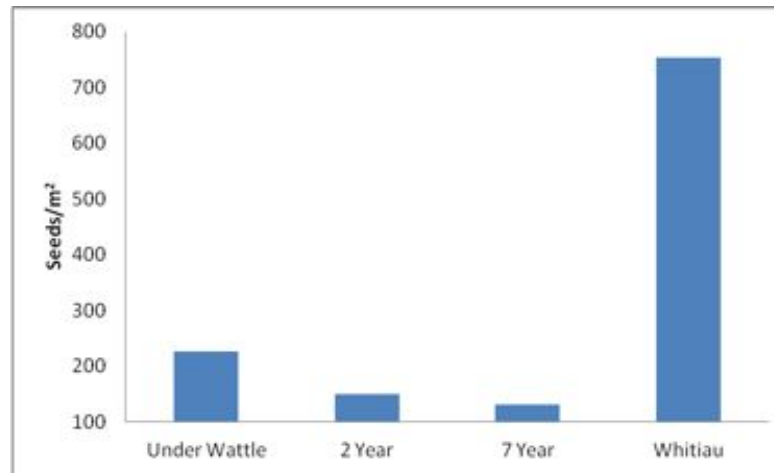
What we did!

- Samples were collected using a 13 cm diameter metal cylinder. (50 mm deep = about 600 gms)
 - Samples were then sifted through two sieves. The first had a 5 mm mesh to remove the large organic debris. The second sieve had 1 mm mesh too eliminate the sand and other particles too small to be *A. sophorae* seeds.
 - Finally the remaining product was sifted through by hand to find the seeds that were mixed with similarly sized debris, and confirmed as *A. sophorae* by microscope.
-
- The 2 Year and 7 Year plots were sampled at different sites within the plot based on varying terrain features. Three sites for the 2 Year plot, and four sites for the 7 Year plot.
 - All sites for both the 2 and 7 Year plots were sampled seven times at random locations within the site.
 - Subsequent to collection, a germination assay was performed. Sites from each plot were pooled to achieve consistent comparisons between fresh and dormant seeds.
 - **Seeds were nicked using a knife to break the hard seed coat and then soaked in water for 24 hours.**
 - The seeds were then transferred to a damp tray for a week.
 - Germination was defined as a protrusion of the cotyledon from the seed coat.

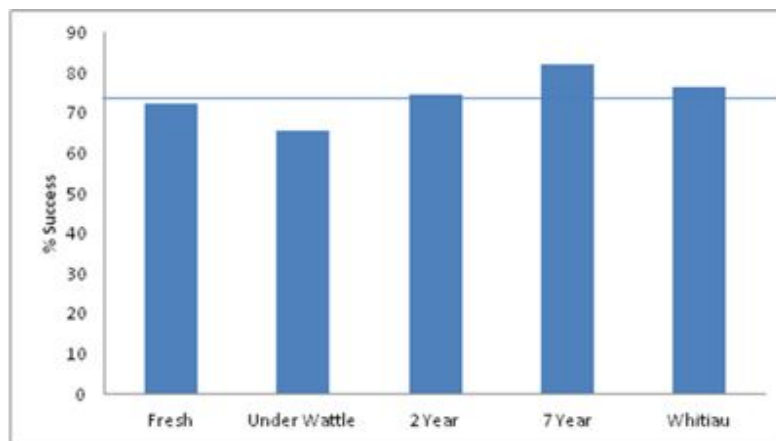
Data

Seed numbers

Site	Seed Density (m ²)
W01	226.1
2S01	391.9
2S02	135.7
2S03	0
2S04	0
7S01	30.2
7S02	271.4
7S03	150.8



Germination rates



Results

- ❑ Seed was found on areas cleared two and seven years earlier
- ❑ Seed numbers were similar, but often lower than under standing Wattle
- ❑ Germination rates were similar, across all samples
- Though the seeds remained viable, not even fresh seeds germinated when their seed coats were left intact (personal comm.)
- Therefore, one could conclude that a stimulus is needed to facilitate germination
- ❖ Few established seedlings are seen on the areas cleared by Castlecliff Coast Care
- ❖ Digging to plant native plants does not stimulate re-growth ?
- ❖ No fires to trigger re-growth ?

We did find the occasional seedlings at Castlecliff



But re-growth is nothing like in the scientific reserve

Why??



Conclusions

In order to properly design and manage an *A. sophorae* removal project, a comprehensive plan that looks beyond the initial clearing is required. Community groups, such as Coast Care, are especially well positioned to provide consistent management.

Given that the seed bank increases with the age of the stand, a degree of urgency in initiating a clearance program is required (McMahon, *et al.* 1996).

When the site is accessible, community groups can provide the hands on management needed to mitigate the damage done by persistent weeds such as *A. sophorae* to native ecosystems, and ultimately restore the indigenous habitat.

