

Marram grass *Ammophila arenaria* removal and dune restoration to enhance nesting habitat of Chatham Island oystercatcher *Haematopus chathamensis*, Chatham Islands, New Zealand

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SUMMARY

Dune restoration through herbicide control of invasive marram grass *Ammophila arenaria* and replanting with native species has resulted in dune reprofiling. This has allowed Chatham Island oystercatcher *Haematopus chathamensis*, an endangered species, to nest higher up the beach where they are less vulnerable to loss of clutches to high tides and storm surges.

BACKGROUND

Marram grass *Ammophila arenaria*, was introduced to New Zealand from Europe to protect farmland from wind-blown sand encroachment. It has however, spread greatly and is now considered a serious and widespread invasive that has displaced the native vegetation that formerly covered New Zealand's dunes. Marram efficiently binds sand and forms tall dunes with steep fronts (much taller and steeper than native dune formations) which are maintained by storm waves cutting into them.

Despite their isolation, 800 km east of New Zealand, the dunelands of the Chatham Islands have suffered the same fate. This is bad news for the endangered Chatham Island oystercatcher *Haematopus chathamensis*. In many areas the coastal strip between the high tide mark to the foredunes (where most oystercatchers choose to nest) has narrowed as the marram infested dunes advance slowly seaward. As a consequence the zone where oystercatchers nest is much reduced and closer to the seashore, and therefore nests are more vulnerable to high tides and storm surges. The birds nest in open areas where they can view their feeding territory, defend it from neighbouring oystercatchers and easily escape predators. Therefore tall and dense dune vegetation (as afforded by marram) is unsuitable for them.

In 1999, the global population of Chatham Island oystercatchers stood at only 142 individuals and the 'Chatham Island Oystercatcher Recovery Plan' was initiated. Restoration of native dune systems was one of its primary objectives.

ACTION

Aims and experimental area: One of the long-term goals of the Chatham Island Oystercatcher Recovery Plan is to restore the coastal dune systems so that less intensive oystercatcher management is required - currently, nests in managed areas are shifted away from the high tide mark to the back of the beach or onto a cleared patch of foredune and in some instances, tyre nest-platforms are provided (Moore 2005a). The idea for the dune restoration sprang from a similar programme which is improving nesting opportunities of snowy plover *Charadrius alexandrinus* in the USA (anon. 2000).

The aim of the restoration was to create a wider area of bare sand, and a more sparsely vegetated and gently sloping foredune. After local consultation in 2001, two sites (approx. 100 m long by 40 m wide) were chosen at Wharekauri (Crown-owned 'marginal strip') and Maunganui (privately owned). These areas had existing stock-proof fences to keep sheep

and cattle off the beaches, and were being managed for oystercatchers (mainly through control of predators using cage-traps – Moore 2005b). The selected beaches also had relatively flat dunes which it was hoped would pose a minimal risk of sand being destabilised when the marram was removed.

Marram removal and replanting with natives: Over the next three years in spring and autumn marram was sprayed (using a knapsack sprayer) with herbicide and cleared, and stubborn regrowth resprayed. Initial treatment of marram used Roundup (a broadscale herbicide) at one site and Gallant (a grass-specific herbicide) at the second. After this initial application Gallant was mainly used so as not to affect native broadleaf plantings.

Weeds were pulled and grubbed out, and cleared areas were replanted with native plants. A number of local and visiting Department of Conservation staff, contractors and volunteers all assisted.

At the two trial dune restoration sites more open and sparsely vegetated areas were created and a succession of sedges, herbs, shrubs and trees were planted. By April 2003, 2,500 native pingao *Desmoschoenus spiralis* had been planted at the front of the foredunes with a smaller number of herbs and shrubs (e.g. 230 forget-me-nots *Mysosotidium hortensia* and 375 *Corokia macrocarpa*). Towards the back of the dune a hedge of 4,500 akeake *Olearia traversii* seedlings were planted to shade out the marram and complete the succession from the beach to coastal forest.

CONSEQUENCES

Oystercatcher breeding response to dune restoration: Within the first year the two trial areas had been visibly transformed and had halted the march of marram down towards the water's edge. The two resident oystercatcher pairs responded by nesting at the edge of the restored areas higher up the beach (where formerly there were thickets of marram), rather than near the high tide mark as they had previously done prior to restoration. One pair nested beside one of our new pingao plants in the 2002/03 breeding season and in 2003/04 moved back further onto a newly forming beach sand crest. At the second area the oystercatchers nested amongst sparse *Carex pumila* (a sedge), which had spread from existing patches to cover the newly-enlarged

area of bare sand. Each year this pair has nested progressively further back from the storm tide zone.

Ongoing restoration: A marram grass eradication programme is currently underway (2005) on a longer section of the coast that is currently managed for oystercatchers. The marram is tough and unfortunately very hard to get rid of. Regular spraying with herbicide has been established to help control the constant re-growth. This will increase beach space and allow the oystercatchers to have a safer natural nesting environment without the need to help them with car tyre nest-platforms or by moving nests higher up the beach.

Conclusions: By controlling marram encroachment of marram, the oystercatchers now nest higher up the beach and consequently further from the high water mark, thus they are less vulnerable to losing clutches to storm surges and high tides. One of the aims of the oystercatcher recovery plan was to create a more natural coastal ecosystem that is better for nesting, this has been achieved. With a relatively small amount of effort positive benefits for threatened dune communities - plants and birds included, have been achieved. Building on this success the Chatham Area Office is planning a step-wise restoration of further sections of dune.

The dune restoration would please the botanist Cockayne who, in 1902, lamented the demise of the iconic Chatham Island forget-me-not: 'the long line of this plant on the seas-shore, with its huge shining green leaves and great heads of blue flowers, is lost to the world for ever'. Perhaps in years to come the dunes will again show some of their former glory.

REFERENCES

- Anon. (2000) Conservation Science Newsletter 36, February 2000.
- Moore P. (2005a) Storm surge protection of Chatham Island oystercatcher *Haematopus chathamensis* nests using tyre nest-platforms, Chatham Island, New Zealand. *Conservation Evidence*, 2, 93-94.
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