Storm surge protection of Chatham Island oystercatcher *Haematopus chathamensis* nests using tyre nest-platforms, Chatham Island, 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

The Chatham Island oystercatcher *Haematopus chathamensis* is only found on the Chatham Islands, which lie 800 km east of New Zealand. A census in 1999 found there to be only 142 birds left. There was a desperate need for a recovery programme and a research project commenced in 1999 to help guide management.

Marram grass *Ammophila arenaria* was introduced from Europe in order to help stabilise sand dunes degraded by introduced livestock (sheep and cattle). Marram however, has changed the profile of the natural dunes - the native dune plant community is much less dense and creates a flater wider dune system (suitable for beach-nesting oystercatchers) in comparison with the dense marram tussocks which create a steep dune system with sand 'cliffs'. Marram gradually takes up more and more of the beach as the foredunes edge towards the high tide mark, leaving little room for nesting oystercatchers and putting their eggs (which take about 28 days to hatch) and young at increased risk of being washed away by storm surges and high tides. In some years, many eggs were washed away and the birds would not breed successfully without human intervention.

The provision of nest platforms (detailed here) was only part of the Chatham Island Oystercatcher Recovery Plan, initiated in 1999, which also entailed dune restoration (Moore & Davis 2005), moving nests (Moore & Williams 2005), stock fencing and exclosures (Moore. 2005a), and predator control (Moore 2005b).

ACTION

Study area: The research was conducted along a 14 km stretch of coastline in the northern part of the main Chatham Island. In some areas the beach (between the high tide mark and foredunes where most oystercatchers nest) had become extremely constricted due to the advance of the marram grass dunes, with sea water rising right up to the base of the marram tussocks during spring high tides and storm surges. In 1998/99 there were 16 oystercatcher territories present along this section of beach.

Tyre nest-platforms: To help prevent oystercatcher eggs from being washed away, an experiment was conducted using two to four nest-platforms placed in each of the 16 territories. These platforms were made from an old car tyre attached to a 1 x 1 m plywood base. The platform was placed in the vicinity of previous nest sites and the base covered in sand. The inside of the tyre was filled with sand which was scooped out a little and decorated with bits of drift wood and dried kelp to emulate a natural but slightly elevated, nest scrape.

Table 1. Average distance Chatham Island oystercatcher nests were moved up beaches, number of nests raised-up on sand mounds and number of clutches laid on nest-platforms, 1998-2005 nesting seasons.

Year	Pairs	Nests	Distance moved (m)	Standard deviation	Range (m)	Number moved	Raised	Clutches on nest-platforms
1998/99	16	23	6.2	2.6	2-10	11	0	1
1999/00	16	21	5.25	4.2	2-15	12	0	2
2000/01	20	26	8.8	7.8	2-32	23	3	7
2001/02	24	33	6.2	4.3	1-18	14	4	5
2002/03	28	32	4.9	2.8	2-10	12	2	3
2003/04	34	43	4.8	4.0	1-12	6	3	5
2004/05	33	72	-	-	-	-	-	-

CONSEQUENCES

Use of tyre nest-platforms: In the first year of the experiment (1998/99 breeding season when 16 oystercatcher territories were present) only one pair laid eggs on a nest-platform, but it was considered that many platforms had been placed inappropriately, not having been positioned in areas where oystercatchers would naturally choose to nest. In 1999/00 when there were again 16 territories and platforms had been positioned better (at least two platforms per territory on or just above the high tide mark) two pairs nested in the tyres and others prospected but did not lay in them. Up to seven pairs have used these raised scrapes, and some pairs have used them in every year since 1999. The platforms protect the eggs from wave surges, but even better, the nest platforms are movable so that as a precaution against threatening high tides, they can be dragged up the beach (around a metre per day). Moving them this distance, the adults are able to relocate the nest and resume incubating. The number of platforms used by oystercatchers each year (and other nest moving data) is shown in Table 1.

Conclusions: The raising of oystercatcher nests onto nest platforms helped to protect them from storm surges and high tides - original nest sites were usually washed over at least once during the breeding season. Despite intervention, in some years with exceptionally high tides, more than half of the clutches were still washed away. Fortunately, most birds lay another clutch of eggs (and may make up to 3-4 nest attempts altogether in a season) if they lose their first clutch.

When the tyre nest-platforms were introduced, it was discovered that oystercatcher nests could easily be moved by shifting the eggs to a new scrape (by scooping out a hollow in the sand) a metre or so further up the beach and moving the nearby driftwood and kelp along with it (Moore & Williams 2005). This was found to be just as effective as using tyre platforms. Therefore, less reliance was placed on the use of the platforms as the recovery plan progressed.

REFERENCES

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