

Fence removal benefits gannets (*Morus serrator*) at Muriwai, northwest Auckland, New Zealand

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Abstract Mainland colonies of Australasian gannet (*Morus serrator*) colonies at Muriwai, northwestern Auckland, New Zealand, were counted between 1999 and 2002. Fences installed in 1981 on the landward side of the colonies were removed at the end of the breeding seasons of 1996 (southern colony) and 1997 (northern colony). Counts 3 years before and after fence removal were compared. After fence removal, the total average number of birds during the peak breeding season (December and January) increased by 65%. The increase resulted largely from an increase in the average number of pairs nesting on the northern colony, and a small increase in the average maximum number of chicks on the northern and southern colonies.

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INTRODUCTION

The Australasian gannet (*Morus serrator*) colonies on Otakamiro Point at Muriwai Regional Park, and Motutara Island have been monitored annually since 1975 by the Ornithological Society of New Zealand (OSNZ), and monthly since 1994 by the Auckland Regional Council (ARC) (Greene 1999). This paper presents continuing counts from 1999 to 2002.

Gannets began nesting on the southern cliff platform of Otakamiro Point in 1979. In 1981, to protect the establishing colony from dogs and vandals, the then Auckland Regional Authority (now ARC) and Royal Forest & Bird Protection Society erected fences on the landward side of the northern and southern cliff platforms. Following heavy rain and slips, the southern cliff fence was removed during winter 1996, and the northern fence was removed during the winter of 1997 (Fig. 1).

Removal of the fences was preferred to replacement, as the large size of the colonies made them less vulnerable to predation and disturbance than the establishing colonies, and occasionally gannets were killed by flying into the fence mesh. The fences also appeared to be limiting colony expansion by restricting access to nesting sites. To test whether or not fence removal was beneficial to the gannets, monthly gannet counts before and following fence removal were compared.

STUDY AREA AND METHODS

The location, study area, and methods followed those in Greene (1999). Muriwai is c. 30 km northwest of Auckland City. Otakamiro Point is a headland made up of 2 cliff platforms, between Maori Bay and Muriwai Beach (Fig. 1). A wide, fenced track leads to 2 viewing lookouts directly over each cliff platform. Motutara Is lies c. 30 m offshore, between the 2 cliff platforms. The ARC manages the gannet colonies on the southern cliff, the northern cliff, and Motutara Is, on behalf of the Crown.

Repeat counts were undertaken from Nov 1999 to Apr 2002 following Greene (1999). Maximum counts were made of chicks each month. Annual trends were determined by comparing monthly counts. To enable comparisons between breeding seasons, the average number of gannets (pairs and chicks) was calculated from counts during the peak breeding period (Dec-Jan). For example, during the 1995 breeding season, the counts from Dec 1994 and Jan 1995 were averaged. Similarly, the total number of birds was calculated by tallying the number of pairs (doubled), chicks and singles.

RESULTS

Annual trends

From 1999 to 2002, the total number of gannets peaked at c. 3000 birds (monthly counts available from ARC). To allow comparisons with surveys from 1975 onwards (Greene 1999), counts in Oct

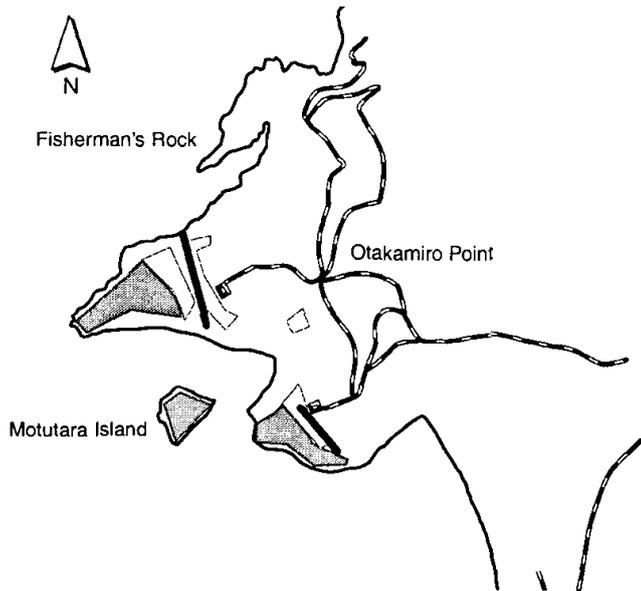


Fig. 1 Otakamiro Point and Motutara Island, Muriwai, Auckland, with location of fences and Australasian gannet (*Morus serrator*) colonies. Heavy line, previous fence; heavy shading, gannet distribution 1994; light shading, gannet distribution 1998.

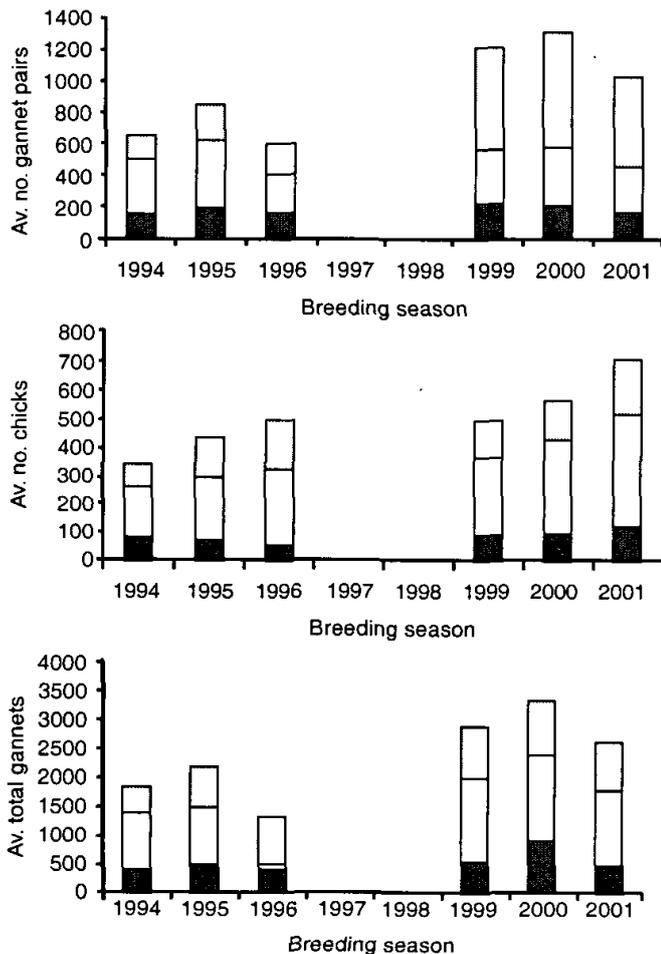


Fig. 2 Average number of pairs, chicks, and total number of Australasian gannets (*Morus serrator*) at the peak of the breeding season (Jan-Dec), 1994-2001. Filled, Motutara Is colony; open, southern platform colony; shaded, northern colony.

Table 1 Average counts of Australasian gannets (*Morus serrator*) at Muriwai, Auckland, at peak of breeding season (Dec-Jan) before (1994-96) and after (1999-2001) the fences were removed.

	Fences		Change
	Present	Removed	
Gannet pairs	699	1185	70%
Chicks	422	508	20%
Total birds	1798	2958	65%

1999, Oct 2000, and Oct 2001 were 2442, 4348, and 2900, respectively. A total of c. 800 pairs on the northern cliff platform in Oct 2000 accounted for the large increase in birds.

Breeding season trends

Fences were removed for the duration of the 1997 and 1998 breeding seasons, during which time, unfortunately, no counts were undertaken (Table 1). The average number of gannet pairs, chicks, and total number of birds during the peak breeding months (Dec and Jan) was compared between years from 1994 to 2001 (Fig. 2).

The average number of pairs and chicks on Motutara Is over the peak breeding season did not change ($\pm 5\%$ between years) before or following fence removal. The average number of pairs on the southern colony remained unchanged, but the average maximum number of chicks increased slightly (Fig. 1). The average number of gannet pairs increased by 70% on the northern colony, and there was a slight increase in the average maximum number of chicks. Overall, the total number of gannets increased following fence removal, largely as a result of increases in the number of pairs on the northern colony and of chicks on both the northern and southern colonies.

After the fences were removed, new nesting sites were established. Gannets on the southern cliff platform nested directly below the lookout platform, and then began clearing vegetation from the more sheltered northeastern-most corner of the cliff platform. Gannets on the northern colonies began nesting on the more sheltered, steeper banks directly below the lookout platform in preference to flat ground directly in front of the lookout platform. Most of these new pairs were not visible from the lookout platform and were not therefore included in counts. It is estimated that 15-20 birds may have not been included in counts from each colony.

DISCUSSION

Annual trends

There were c. 700 pairs at the Muriwai gannet colonies from 1988 to 1996 (Greene 1999). From 1996 onwards, the total had increased 110%, with about 1500 pairs present. None of this increase was attributable to population changes on Motutara

Island. The greatest increase in the number of pairs occurred on the northern cliff platform.

That the northern cliff platform has not reached a carrying capacity was demonstrated by large fluctuations in the numbers of pairs and birds between years. From 1994 to 1996, for example, the number of pairs ranged between 156 and 740 (Greene 1999). After the fences were removed at the end of the 1997 breeding season, the number of gannets ranged from *c.* 350 to 800 pairs.

Breeding season trends

To allow more direct comparisons, counts of the number of gannet pairs and chicks and were averaged over the peak breeding season (Dec-Jan). After the fences were removed, the total average number of pairs increased by 70% largely because of an increase in the average number of pairs nesting on the northern colony and a small increase in the average maximum number of chicks on the northern and southern colonies.

Conclusions

When first erected in 1981, the fences protected the establishing gannet colonies from vandals and dogs. Initially, gannets nested seaward of the fences, but since 1988, birds (especially on the northern cliff platform) nested to the landward side of the fences.

The transition from a prospecting colony to an established colony on Otakamiro Point took *c.* 7 years. In hindsight, the fences could have been removed then, with little increased risk to the gannets. Removal of the fences after 16 years resulted in an immediate increase of the number of pairs on the northern cliff platform, and a slight increase in the maximum number of chicks on both colonies. Similar increases in colony size following removal of a fence were recorded at Cape Kidnappers (Robertson 1992).

Over all, removal of the fences benefited the gannets at Muriwai. The greatest expansion, as recorded in an increased number of pairs, resulted from better access to nesting sites on the northern cliff platform.

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