

Progress of the Norfolk Island Boobook Owl

Ninox novaeseelandiae undulata

Re-establishment Programme

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ABSTRACT

The Norfolk Island Boobook *Ninox novaeseelandiae undulata* is confined to small, isolated Norfolk Island, an Australian territory. In 1986 it was established that one owl, a female, survived. The scarcity of large nest trees, due to past logging, and introduction of predators and competitors for tree holes, appeared to be the main conservation problems. In September 1987, two male New Zealand Moreporks *N. n. novaeseelandiae* were introduced. The female paired with one male and has produced four hybrid offspring. Two of the hybrid young appeared to have formed a pair by mid-1991 and were provided with nest boxes. A third unpaired youngster laid eggs in 1992. Islanders, the Australian National Parks and Wildlife Service and New Zealand wildlife authorities have co-operated in an attempt to re-establish an owl population. The effort is low-cost, requires little man-power, and is carried out in the wild with minimal disturbance to the sole extant female, concurrent with programmes to control introduced cats, rats, birds and plants.

INTRODUCTION

Norfolk Island is a small, isolated Australian territory: 3,450 ha in area, situated 1,367 km east of the mainland and 675 km from New Caledonia, its nearest neighbour. Two other small islands, Nepean and larger Philip Island (ca. 2km²), complete the Norfolk Island Group.

The rainforest-clad island was discovered in 1774 and later used as a penal settlement. By the early 1990s, three-quarters of the forest had been cleared and the remainder had deteriorated due to logging of prime trees, infestation by weeds and degeneration from exposure (Lane-Poole 1926; Smithers & Disney 1969; Schodde *et al.* 1983). In 1986 12% of the island was proclaimed a National Park, encompassing the two mountains (the highest reaching 318 m) and the only remaining intact fragments of original forest.

Today approximately 2,000 people populate the island. Habitat destruction, and deliberate introductions and self-introductions of exotic plants and animals have resulted in several extinctions. Since settlement, six of the island's fourteen endemic land birds have become extinct and a seventh species, the White-breasted White-eye *Zosterops albogularis*, has not been seen for several years. The Red-fronted Parakeet *Cyanoramphus novaeseelandiae cooki* numbers about 30 individuals and requires extensive management to protect the population from rats, introduced Crimson Rosellas *Platycercus elegans* and possibly domestic and feral cats.

The Norfolk Island Boobook *Ninox novaeseelandiae undulata* is thought to be a distinctive subspecies of the New Zealand Morepork, and is the only Australian owl considered to be endangered (Clarke *et al.* 1978; Garnet 1992; Collar & Andrew 1988). First recorded in the late 18th century, when it almost certainly would have occurred throughout the island, the owl is said to have largely been confined since 1909 to the gullies surrounding Mt. Pitt (Bassett-Hull 1910; Turner *et al.* 1968; Smithers & Disney 1969). However, according to the islanders it was occasionally seen in more open country. From this apparently depleted population Bell (1912-13), with a permit to remove six owls, took thirty specimens for a Sydney collector. In more recent years, visiting biologists reported hearing few, if any, owls (King 1979; Wakelin 1968; De Ravin 1975). As early as the 1960s a lack of holes for nest sites, due to logging of mature trees, was seen as a major problem (Turner *et al.* 1968; King 1981). A survey of the island's birds in 1978 located perhaps three individual owls (Schodde *et al.* 1983; Rooke 1986), yet no conservation action was taken. A search in 1985 was unsuccessful, but because islanders occasionally heard an owl it was concluded that at least one still existed (Rooke 1986).

A group of concerned ornithologists visited the island in 1986 and, assisted by Australian National Parks and Wildlife Service (ANPWS) staff and locals, were able to find only one owl, a female. She was trapped for measurement and marking, and released (Olsen 1989; Olsen *et al.* 1989). A follow-up survey in 1987 unearthed no additional owls although the female was seen on several occasions (Olsen, unpubl. report to ANPWS). Recommendations for a wild-based re-establishment programme were made, nest boxes were erected in the National Park, and in September 1987 two males of the closest extant subspecies, the New Zealand Morepork, were released (Olsen *et al.* 1989; Hicks *et al.* 1990; Olsen & Moon 1990; Hicks 1991). Olsen (1993) discusses some of the taxonomic and genetic considerations and conservation rationale behind the re-establishment attempt. Here we report on the progress of the programme.

METHODS

The capture and sexing of the original female, and recommendations for re-establishment, are described by Olsen *et al.* (1989). In 1986 fourteen nest boxes of three designs were hung in large trees in the area frequented by the female. One was an artificial hollow made from cement, the others were boxes made from marine-ply and were of two designs, one long and the other deep (donated by the Island's Flora and Fauna Society). Painted tin around the entrance protected the boxes from Black Rats *Rattus rattus* and Polynesian Rats *R. exulans*. Boxes were checked regularly and cleaned out if used by European Starling *Sturnus vulgaris* or Crimson Rosella. Once the female had settled near a nest box, an attempt was made to remove from the area all Crimson Rosellas, which are aggressive competitors for nest sites. As it became obvious that the owl did not use certain boxes these were removed to streamline nest checks. Although the locals were kept well informed of progress, to minimise the risk of disturbance the siting of the boxes was away from areas used by the public and their location was not released.

In September 1987, courtesy of the New Zealand wildlife authorities, two male New Zealand Moreporks, which had been sexed by laparoscope, were hacked from two of the nest boxes. For future identification, both were banded with an individual leg band: stainless steel over which some reflective tape had been glued. Aided by local volunteers, ANPWS staff conducted regular 'listenings' for the owls.

Disturbance of the nest boxes and the owls was limited: boxes were checked every two to three months. During the breeding season, at boxes with signs of owl activity observations were made from the ground, around dusk, and the box was inspected briefly and only after the owls had left to hunt.

About one week before fledging, the hybrid chicks were weighed, measured, individually banded (reflective tape) and a blood sample was taken for future DNA analysis.

RESULTS

Brief Summary of Breeding Attempts:

Almost immediate use of nest boxes added support to the notion that a lack of suitable holes in trees was a problem. The deeper boxes were favoured by the owl, that is, those she could not see out of when standing on the nesting substrate (290 mm long x 270 mm broad x 490 mm deep).

The Norfolk Island female paired with one of the New Zealand males almost immediately: they were seen and heard together within the area previously frequented by the female. In early October 1988 the female laid one egg which later disappeared. In 1989, two chicks hatched and were measured on 8th December. They fledged on the night of the 14th December and appeared to remain with their parents until the following winter. Similarly, in 1990 the pair raised two chicks, which were measured on the 5th December and fledged about the 15th December.

Surveys by ANPWS staff and locals in mid-1991 located the breeding pair and probably all four of their offspring, two of which (one fledged 1989 and one 1990) were together. An additional nest box was erected near to where the young pair were sighted. In 1991 the original pair laid two eggs, which broke after 2-3 weeks for unknown reasons. In 1992, the eggs broke late in incubation, almost certainly due to invasion of the box by introduced honey bees which proceeded to build a hive. The same year, one of the hybrid offspring, apparently unpaired, laid four eggs.

The Hybrid Chicks:

In both years the plumage of the chicks seemed to most resemble that of their New Zealand parent, darker than that of the Norfolk Island owls. When measured the chicks were about 4 to 4.5 weeks old and not fully grown, however their tarsus and culmen were probably close to full-sized. At that time, none was as large as the Norfolk Island female (Table 1). Similarly, none of the chicks was as heavy as the Norfolk Island female, but all were heavier than the median weight of 19 New Zealand females (mean 163 g, range 105-212; males-median 156, mean 160, range 105-195, Lex Hedley unpubl. data from museum skins). Thus we were unable to determine the sex of the chicks. However, in the 1990 brood one chick had noticeably smaller eyes than the other, perhaps indicative of a difference in sex, and the chick 'blue' later laid eggs. Survival appears to be good: all the chicks were located early in 1993.

Table 1. A comparison of weights and some measurements from the Norfolk Island Boobook female and her four hybrid chicks.

Norfolk Island female		Hybrid Chicks 1989		Hybrid Chicks 1990	
Band Colour		Green	Blue	Yellow	Orange
Exposed culmen (mm)	15.6	14.5	14.4	14.1	13.8
Tarsal breadth (mm)	4.4	4.1	4.1	3.5	3.8
Weight (g)	213	185	179	180	195

DISCUSSION

The breeding of the owls in the wild, as opposed to the captive alternative, has meant that disturbance of the original female has been minimised and her offspring are well adjusted to the wild. Overall, monitoring of the breeding pair has not proven difficult. The programme has been low-cost (averaging > \$A 2000-3000 per annum) and low effort.

Because the owls breed only once a year, and have a two-egg clutch, the recovery effort has been slow. Early in the recovery programme, removal of a clutch to an incubator (allowing the owls to re-lay) was considered to have unacceptable risks, but is an option for the future. Introduced species, Crimson Rosellas and bees, which are aggressive competitors for nest holes, cause the greatest concern. The Rosella can be controlled by removal from the area frequented by the owls; the bees are an insidious and potentially more dangerous threat.

A difficulty with a the wild-based programme has been to monitor the owls precisely, particularly the hybrid offspring once they reach independence. Future work may include radio-tracking of the juveniles. Apart from continuing management problems with the owls until they become well established, a problem which has arisen is the potential conflict between the owl recovery programme and the rat control programme, both conducted by ANPWS. Rats are significant predators of eggs and chicks of the island's smaller birds and destroy much young vegetation, hampering revegetation efforts. Control by baiting carries with it the risk of secondary poisoning of owls. The owls occasionally eat rats, but insects in particular, and small birds

are more important prey. Various rat control measures have been tried, most recently an on-going programme with Quintox (dieldrin-based).

The Lord Howe Island Boobook *N.n. albaria*, another distinctive subspecies, was extinct by 1950. Had no action been taken the Norfolk Island Boobook would also have disappeared. If a viable population of hybrids can be established, then some of the genes of the original owl will be preserved. No decision has yet been reached, but it seems likely that once a viable population is established it will be left to nature to select owls most suited to existing conditions on the island.

The initial early success of the re-establishment programme must give hope to other conservation projects for very rare taxa. The extraordinary plight of the original owl, and her appeal and that of her chicks, have received wide media coverage and garnered the attention of many in positions of authority and the public at large. The project has strengthened relations between the Norfolk Islanders and ANPWS, benefiting other conservation efforts on the island. Not least, it has given a great boost to island conservation in Australia, previously much neglected.

Stop press: October 1993 - the two hybrid offspring which paired in 1991 are incubating three fertile eggs

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