

MULTI-GENERATION BREEDING OF STONE CURLEW *Burhinus o. oedicnemus* AT POZNAŃ ZOO

by Piotr Ćwiertnia

Introduction

The nominate race of the Stone Curlew *Burhinus oedicnemus oedicnemus* has become one of the most endangered species of birds in Europe. In spite of a still quite large European population estimated at 32,690-45,704 (37,299), there has been a marked decrease in overall numbers, and in many areas it has become extinct recently (Nipkow, 1997; Cramp, 1983). Only extensive activities undertaken in Great Britain leading to the conservation of this species in the wild through strict nest protection (Green, 1986) has resulted in a slow increase (del Hoyo et al. 1996). In Poland the number of breeding Stone Curlews has decreased critically during the last few decades (Tomiałojć, 1990). Therefore it is important to perfect captive breeding techniques for the Stone Curlew, as this may soon be the only chance to safeguard the survival of this species.

At the end of 1997, there were 73 Stone Curlews in 13 zoological gardens, 56 of which were captive bred (ISIS, 1997). Between 1958 and 1992, 211 Stone Curlews were hatched in 17 institutions (races not specified in the *International Zoo Yearbook*). All of the Stone Curlews hatched in the 1997 originated from just six pairs, of which two were in Poznań, and the other four were maintained in Clères (France), Paignton (UK), London (UK) and Vienna (Austria) (ISIS, 1997). The largest number of Stone Curlew ever hatched (129), was at Great Witchingham (UK) (*International Zoo Yearbook*). The original pair came from the wild (Wayre, 1971). It is likely that the majority of Stone Curlews living in captivity at present originate from this pair.

The History of Keeping Stone Curlews at Poznań Zoo

The first Stone Curlews arrived in Poznań Zoological Garden on October 21st 1986, from the Norfolk Wildlife Park at Great Witchingham. There were three pairs, probably bred there in 1986. Unfortunately, during 1987 two females and one male died. Two more females were imported from Great Witchingham on February 25th 1988, but both died the same year. To provide some much needed additional genetic variability, in 1996 we imported from Ramat Gan, in Israel, three birds injured on migration and not suitable for release.

The first pair of Stone Curlew (P1) was formed in 1989. They laid two fertile eggs, and both chicks were reared. They laid their next clutch in 1992 after a two-year break, and subsequently laid regularly every year until

1997, when both birds died. The second pair (P2) was established in 1993 from an individual originated from Great Witchingham and one reared in Poznań, but this pair laid infertile eggs only. The third pair (P3) was formed in 1996 from birds reared in our zoo, and in that year this pair laid 10 eggs from which two chicks were raised. These birds belong to second generation raised in our zoo and third or more generation raised in captivity.

From Stone Curlew raised at Poznań, in 1997 we created a fourth pair (P4) which laid two infertile eggs, this time inside the shed. This pair was the first to incubate their eggs themselves. Shortly before the completion of the incubation period, one of eggs was swapped for a newly hatched chick, but this ended in failure, when two days later the chick was killed by the foster parents. In the same year, two additional pairs were formed, one (P5) laid four eggs but all were broken by the birds themselves, and the other pair (P6) failed to lay. The latter was the third pair created during the year and involved the birds from Israel.

Table 1. Pairs created at Poznań Zoo

	Date of Hatching Parent A	Date of Hatching Parent B	Origin	Year of Pair Creation
P1	05.1986	05.1986	Great Witchingham	1989
P2	unknown	unknown	Poznań/ G. Witchingham	1993
P3	04.06.1994	03.06.1989	Poznań	1996
P4	14.06.1994	16.06.1994	Poznań	1997
P5	02.06.1994	07.06.1995	Poznań	1997
P6	unknown	unknown	wild	1997

The birds are not sexed and there is the possibility that pairs P2, P4 and P6 are homosexual

Housing

Upon arrival in our zoo the birds were placed in cages measuring 4.9m x 4.9m x 3m high (approx. 16ft x 16ft x 9ft 10in high). These are covered with wire mesh, with the rear walls covered with straw mats or wooden planks. There is a den measuring 1m x 3m x 2.5 m high (approx. 3ft 3in x 9ft 10in x 8ft 2in high), which is heated in cold weather so as not to allow the temperature to fall below 0°C (32°F). The cages are furnished with tussock grass, pine branches, and other materials to allow the birds to hide from visitors, and there is a shallow pool but the birds never use it.

The first pair created from birds originating from Great Witchingham, and fourth pair created from birds hatched in our zoo, have been kept in this kind of accommodation as well as a number of young birds hatched here. Paired birds are moved to off-show breeding cages measuring 2m x 3m x 2m high (approx. 6ft 6in x 9ft 10in x 6ft 6in high). The sides are covered with wire netting and at the back of each cage there is a small room measuring

1m x 2m x 2m high (approx. 3ft 3in x 6ft 6in x 6ft 6in high). The cages are in a row, with five cages placed together and all occupied by Stone Curlews.

Food

The adult birds are fed once a day for five days a week. The food consists of cooked egg, cooked rice, white cheese, ground meat and ground (minced) fish. In addition, from time to time the birds also receive small laboratory mice *Mus musculus*. The preferred food is mice and then cooked egg and ground meat. We do not add any mineral/vitamin supplements to the food.

Breeding

All unpaired and young birds we try to keep together in a communal cage. Birds aged three years (which is when breeding activity usually begins) are allowed to select a partner of their own choosing. A mated pair begin to chase away other birds and is removed to another cage. A few days before egg laying begins, the birds dig a shallow depression in the ground. This is usually located in the same place every year.

The original pair chose a place near the cage perimeter, close to the path used by visitors and this was a reason why we never left them to incubate their own eggs. The third pair chose a place in the middle of the cage, but this pair usually lay their eggs outside the nest which could be because of the small dimensions of the cage. In 1997, we tried to leave the eggs with this pair for them to incubate and hatch but this ended in failure. The eggs of the fifth pair (P5) were destroyed by the birds themselves immediately after being laid.

The breeding season starts in March or April. The earliest clutch was laid on March 10th. The second egg in a clutch is laid 1-4 days after the first, with two days being the usual interval. The second clutch is laid 9-57 days later, with 12 days later being the most usual. Pairs usually lay two clutches, each with two eggs. However in 1995, after moving the original pair to another cage, they laid four clutches totalling eight eggs, but the next year this pair laid only one egg. In 1997 this pair laid three clutches. High egg laying characterised the third pair, which in 1996 laid 10 eggs, and in 1997, 20 eggs! Information about hatching results is summarised in Table 2.

The eggs are artificially incubated at 37.2°C (99°F). Incubation lasts for 25-28 days. All Stone Curlew chicks in our zoological gardens, apart from one unsuccessful effort, have been hand-reared. After hatching the young are kept in bowls, with sand on the bottom. The temperature is maintained by an infra-red heater at 30°C (86°F). We start feeding from the second day. At the beginning they receive dead cricket nymphs *Acheta domesticus* and the larvae of mealworms *Tenebrio molitor*. At the same time they receive food containing cooked rice, white cheese, ground meat and boiled egg.



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A one day old and a two day old chick in the rearing container



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Stone Curlew chick at 10 days old

When the chicks are a few days old they actively search for food, and at this time we start to feed them live crickets. During the course of the chicks' growth we change the proportions of food, slowly decreasing the quantity of insects. After two weeks we move the chicks to rearing cages. If birds grow up healthy, which is usually the case, we do not use any mineral/vitamin supplements.

Table 2. Breeding results at Poznań Zoo

Year	Pair	Eggs Laid	Fertile	Hatched	Reared
1989	P1	2	2	2	2
1992	P1	2	2	2	2
1993	P1	3	3	3	1
	P2	4	0	0	0
1994	P1	4	4	4	4
	P2	3	0	0	0
1995	P1	8	7	7	7
1996	P1	1	1	1	0
	P3	10	6	3	2
1997	P1	6	5	3	0
	P3	20	13	5	1
	P4	2	0	0	0
	P5	4	?	0	0
Total		69	43	30	19

Veterinary Problems

The main cause of death among chicks has been related to incubation (the yolk not being absorbed properly) with some chicks also being lost due to splayed legs. With adult birds the main cause of death has been through injuries, with three caused by predator attacks. In addition, two have died of avian tuberculosis.

Conclusion

Stone Curlews easily adapt to different habitat (cages here are in forest) and food. Hand-reared birds form pairs easily with little sign of imprinting.

To summarise, Stone Curlews are easy to keep and rear and provide a welcome addition to the collection of conservation minded zoos. Their breeding may in the near future have a definitive conservation value.

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