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Foster parenting, growth and management of the Common trumpeter

Psophia crepitans

at the National Zoological Park, Washington

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Little, if any, research has been conducted on the dynamics of rearing the Common trumpeter *Psophia crepitans* in captivity. This study, which was carried out from February 1985 to August 1988, addresses management techniques with regard to parent-reared and foster-reared Common trumpeter chicks.

In February 1985 2.1 Common trumpeters and one Collared aracari *Pteroglossus torquatus* were exhibited together in an L-shaped exhibit measuring 8.5 × 4.9 × 4.3 m high on the long axis and 3 × 2.4 × 4.2 m high on the short axis. Although no nesting or breeding behaviour was observed that year, there was aggression between the two ♂ trumpeters in July and the subordinate ♂ was removed.

In March 1986, to give the birds a greater sense of security and improve the chances of their breeding, a visual barrier was erected preventing the public from viewing the exhibit from two sides. On

10 July the first of three white eggs was observed in a nest scrape c.25 mm deep. As a precautionary measure the Collared aracari was removed from the exhibit when the first egg was seen.

Although a nestbox was provided the birds nested on the ground at the highest point of the enclosure beside a large upright log placed against a wall. The nest site was as far from the public as possible and not visible from the viewing area. Although located only 1.8 m from the entrance door, it was also hidden from the keepers as they entered the exhibit.

Incubation by both the ♂ and ♀ began after the third egg had been laid. One egg hatched 28 days later and another the following day. The third egg was found to have a small puncture and an early dead embryo. Within a day aggression occurred between the chicks, with the older of the two attacking its sibling. Although the parents showed signs of agitation they made no attempt to intervene. To avoid

injury and possible death we removed the subordinate chick and fostered it to two ♂ Common trumpeters housed in another exhibit.

The two ♂♂ had no known previous experience of rearing young. Both accepted the chick, one assuming a more dominant role in parenting than the other, and within hours they were offering it live crickets. The foster parents' feeding behaviour was identical to that displayed by the true pair, that is, the flicking of the wings up and down accompanied by a call which begins with short notes and ends with drawn-out, loud, reverberating cries. When the food pan was put into the enclosure both natural and foster parents fed their chick first before attempting to feed themselves.

Neither foster parent showed any inclination to brood the young during the first day and a heat lamp was provided for warmth, the chick roosting beneath it for the first night. The following day, however, the dominant ♂ began to brood the young. No aggression was observed between the two foster parents at any time during the fostering period.

The foster-reared chick, which was determined to be ♂ by laparoscopy, remained with its foster parents for nine months until it was transferred to the National Aquarium in Baltimore where it was successfully paired. The parent-reared chick was found dead on day 45 from an infection which occurred probably because the yolk-sac had not been properly absorbed.

In February 1987 the pair produced a clutch of three eggs laid on 26 and 28 February and 2 March using the same nest site. On 30 March all three eggs hatched and when the chicks were two days old a similar pattern of aggression was observed. The dominant aggressor, later found by laparoscopy to be ♀, was left with her parents. The other two, both ♂♂, were placed in separate brooders prior to being fostered the following day.

The two ♂ foster parents were at this time housed together in an off-exhibit

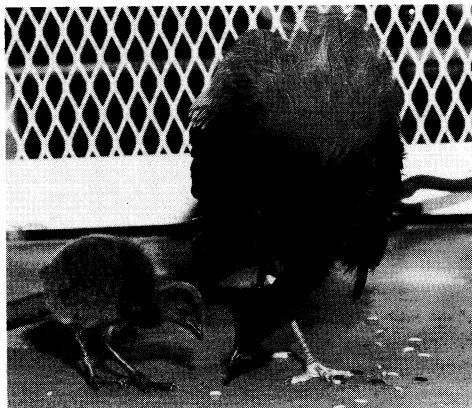


Plate 1. Foster parent Common trumpeter *Psophia crepitans* feeding a nine-day-old fosterling. The drop wing posture of the adult ♂ as he calls the chick to feed is typical. Jessie Cohen, NZP.

1.8 × 3 × 2.1 m high holding cage. Before the introduction of the chicks they were separated and placed in adjacent holding cages of the same size with a 25 mm wire-mesh separating them. After an interval of three hours to allow them time to adjust to the move each received a chick from the brooder. As with the original fosterling, both adults responded to the introduction by vocalising and jerking their wings (Plate 1) for *c.*30 minutes but neither adult was observed feeding his chick until the following day.

Each cage was equipped with a heat lamp and, although both foster parents were observed brooding, the chicks would often lie by the lamp after the cage had been hosed clean. It was a common and amusing sight to see the foster adults sitting low to the floor with the sleeping chicks perched on their backs.

The chicks were provided with perches 50 mm in diameter and 0.6 m in length to give them exercise in grasping and encourage proper toe development. To avoid leg damage to the adults the perches rested on a 0.6 × 1.2 m piece of indoor-outdoor carpet and were positioned beneath the heat lamps. The carpet, which was replaced daily, provided secure footing and also helped to ensure proper toe



Plate 2. Foster parent Common trumpeter ♂ with 39-day-old chick. Although the chick has developed adult plumage its legs and bill are still noticeably different from the forest green legs and bill of the adult. *Jessie Cohen, NZP.*

development. Originally pine chips were placed in a portion of each cage to help keep the chicks off the cement floor but these were removed when it was seen that the chicks avoided them.

Kepler (1978) found that in Whooping crane *Grus americana* chicks leg abnormalities appeared when rapid weight gains placed excessive stress on the legs. Kowalczyk & McNeal (1984) observed a slight bowing of the legs in one parent-reared Common trumpeter chick. We left a food pan available for 24 hours a day until the chicks were seven days old but then restricted the access to food to seven hours a day, from 0800 to 1500 hours, to avoid too rapid a weight increase (Table 1). With this regime no leg problems developed.

The fostered chicks were first observed to feed themselves on day 17. After day 29

the parent-reared chick began running with her parents rather than hiding when a keeper entered the enclosure. At 39 days all the chicks had developed their adult plumage and were observed using high perches. It was not until day 70 that their legs changed colour from black to the bluish forest green seen in adults (Plate 2). The bills of the two ♂♂ began changing from black to blue-green on day 240 but in the ♀ this still had not occurred by day 356. On day 87 the three juveniles were removed from the adults' enclosure and were housed together in one 1.8 × 3 × 2.1 m high holding cage; no aggression has been observed.

In August 1987 the original pair laid a third clutch of four eggs (Table 2) again at the same nest site. After five days' incubation it became necessary to move the birds to another enclosure. We provided a nest

DAY	♂ FOSTER-REARED (g)	♂ FOSTER-REARED (g)	♀ PARENT-REARED (g)
2	41	43	
3	42	45	
5	55	57.5	74
7	82.5	79	94
9	100	98	100
11	114	123	128
13	138	153	159
15	184	195	195
17	206	219	210
19	225	245	230
21	243	256	264
23	280	300	295
25	307	335	330
27	332	353	344
29	382	387	374
33	422	435	448
37	462	457	535
43	529	544	572
52	635	662	705
61	685	714	810
70	749	784	850
87	812	829	955
113	900	897	1060
162	950	915	1220
211	950	910	1255
250	980	955	1220

Table 1. Growth of Common trumpeter chicks *Psophia crepitans* hatched at Washington NZP. The adult ♀ weighed 1090 g. The three adult ♂♂ were 1052, 1152 and 1185 g, the breeding ♂ being the heaviest.

scrape in the most secluded portion and placed eggs in it in the hope that the birds would accept this but they failed to incubate. In July 1988 the original pair again laid a clutch of three eggs, all of which hatched. One chick was left on exhibit with its parents and the other two were placed in a 1.8 × 3 × 2.1 m holding cage with one foster ♂. Aggression between the chicks was prevented by separating them with a 0.6 m high dividing fence, which allowed the ♂ to hop back and forth to care for each chick. He successfully reared both chicks.

DISCUSSION

Sibling aggression has been well documented in the trumpeter's near relatives the cranes and is believed to be one of the main reasons that Sandhill *Grus canadensis*

EGG	LENGTH (mm)	WIDTH (mm)	SHELL THICKNESS (mm)
1	58.25	45.72	0.4
2	60.63	48.92	0.49
3	61.49	49.73	0.43
4	59.5	47.19	0.42
5	57.65	48.11	0.51

Table 2. Egg measurements from two clutches of Common trumpeters at Washington NZP. Egg 1 is from the pair's first clutch; eggs 2–5 are from the third clutch.

sis and Whooping cranes rear only one chick at a time (Walkinshaw, 1965; Miller, 1973; Erickson & Derrickson, 1981).

The first successful breeding of the Common trumpeter in captivity occurred at Woodland Park Zoological Gardens where both eggs hatched successfully; the second chick, however, was found lying just outside the nest with severe injuries to the left eye and head area (Kowalczyk & McNeal, 1984). The data from four separate clutches, two from Woodland Park and two from National Zoological Park, provide evidence of sibling aggression and chick trauma and support the conclusion that sibling aggression is a common phenomenon in this species.

In the wild trumpeters are gregarious living in groups of up to six individuals (Willis, 1983). The adults are not territorial and may allow other adults in the group to help rear their chicks. At Woodland Park a pair of trumpeters and an unpaired adult ♀ shared in the rearing process of the chick (Kowalczyk & McNeal, 1984). This rearing behaviour by non-parental adults in the wild may help to explain the success we had with fostering.

To rear more than one chick from the same clutch the young can be separated and foster-reared by other adult Common trumpeters or chicks can be separated physically with one adult given access to care for more than one chick. A second option would be to separate the breeding

pair and assign each parent to one chick. We avoided hand-rearing for two main reasons: first, it is time consuming and labour intensive and secondly, we did not want to risk the chicks becoming imprinted on humans. Foster-rearing was an attractive and successful alternative.

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Breeding the Black-necked aracari

Pteroglossus aracari

at Barquisimeto Zoo

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In November 1985 two young Black-necked aracaris *Pteroglossus aracari* were received by the Barquisimeto Zoo as an exchange and the following February two more mature birds were obtained. After a period of acclimatisation the four birds were housed in a hexagonal enclosure 2.2 m high and measuring 1.8 m on each side. The aviary was covered in wiremesh on four sides, with the two rear walls constructed of stone blocks and lined with upright branches of bamboo. About a third of the cement floor was covered with earth and large stones, tree trunks and small dry trees were placed about the enclosure. In the centre was a small pool and a hollow palm tree trunk was provided as a nesting site (Fig. 1).

The birds were fed on chopped fruits, such as papaw, melon, water melon and bananas, mixed with chopped lettuce, cabbage and grated carrot. Moistened dog meal was added to the feed as a source of protein.

The four aracaris shared the enclosure for several months until the end of September 1986 when signs of aggression were observed directed mainly at one individual. On 2 October this bird was found dead and for a short time the remaining three appeared to be living peacefully. In early November, however, the agonistic behaviour began again, with two of the birds directing severe attacks towards the third until it was killed on 8 November.

Following the death the pair became