

DEVELOPMENT OF THE WHITEFACED DUCKLING

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Introduction

At Nchalo, Malawi (16°16'S, 34°55'E) in the marshes of the lower Shire valley, the White-faced Duck *Dendrocygna viduata* is very common. Breeding is dependent on the rains, generally occurring from late December to late May.

The local inhabitants of the Shire valley frequently capture young ducklings and either eat them or endeavour to sell them to the Europeans. On several occasions, I obtained ducklings (although I did not pay for them, threatening the people concerned with the Police if the ducklings were not handed over) and raised them until they were old enough to join the wild flocks.

Ducklings were kept in a cardboard box with a hot-water bottle while they were small. They were fed on Pronutro and chicken grower's mash, which were floated on water in a wide, shallow bowl. Once they had learned to dabble in the water for their food, it was no longer necessary to float it. Ducklings were given swimming facilities; a baby's bath was placed in the base of an armchair which had been lined with plastic and towelling, while over the side of the bath a small towel was placed, to act as an exit ramp. Once they had completed their ablutions, the ducklings climbed onto the chair back, sat in a row, preened and then slept until feed time.

When the ducklings were partially feathered, they were allowed to go outside and play in our 0.25 ha, pond during the day, where they could feed themselves. At night, they were penned in on the veranda and given wet grower's mash in a bowl; this made it easier to persuade very active little ducks to come home in the evening.

While tiny, all ducklings were weighed and had the wing length measured at fairly short intervals, but once they were outside for much of the day, they were not handled very often, although I did try to obtain measurements just before or after first flight and when the wings were fully grown.

Six groups of ducklings were acquired. Their provisional hatching dates were assumed to be: *ca.* 9 April 1976 (two ducklings, of which one survived); *ca.* 1 June 1978 (four, of which one survived); *ca.* 21 February 1981 (six); *ca.* 25 March 1983 (five); 7/8 February 1985 (three) and *ca.* 6 January 1987 (three). Only the first two were sexed (on behaviour): A was female and B was male.

Methods

Wings were measured in millimetres on the flattened chord and weight was taken on a Pesola scale, correct to 0.1 g while the birds were small and correct to 1.0 g later, although for some, once they were nearly full-grown weight was taken correct to 5.0 g.

Contour and flight feather growth (generally only the primaries) were scored as for moult, with 0 = no sign of feathers, 1 = in pin, 2-4 = growing and 5 = new (fully grown). Thus P=3 indicates that all the primaries were half-grown. Otherwise the growth of contour feathers and the post-juvenile body moult were scored as X = light and XX = heavy. The same scoring system was used for wild adults and immatures.

Results

Table 1 gives the wing length and weight of five adult males, five adult females and two full-grown immatures which were caught or shot at Nchalo. It also gives the wing length

and weight of the survivors of the six groups of ducklings, their approximate age and the stage of primary wing feather development on the last occasion that they were measured.

Table 2 gives the month and state of moult of the adult and immature wild birds and an approximate scale showing wing and plumage development and weight with age (in days) of the captive ducklings.

Figure 1 shows duckling development graphically, using wing length and weight, while Figure 2 shows it using age (in days) and weight. In order to simplify the graphs, the mean wing length and weight of each group of ducklings was used to obtain each point on the graphs, not the individual measurements. As it is probable that groups consisted of both sexes and females appear to be slightly smaller (Table 1), the graphs give only a rough indication of overall wing and weight increase.

The first duckling raised to maturity (A, a female) was large and heavy, but she took little exercise. The second (B, a male), although much the same size, did take some exercise

and was considerably lighter. However, both these birds fit nicely with both the curves of development with age and the points marking mean wing length and weight of the wild birds, in Figures 1 & 2.

Group E does not fit well. Up to about 70 days old, their weight was much the same as found in previous groups, but thereafter weight gain was reduced, although wing length increased more or less normally. Minimum and mean wing length were slightly less (Table 1, Figures 1 & 2) and the development of adult plumage was slower than in other groups. However, the birds were perfectly healthy and they flew at the same age as did earlier groups. It is extremely unlikely that the lower weight was due to Group E having consisted entirely of females, while all the other groups consisted of males, as wild females which were dissected were not much lighter than known males. The most probable explanation is that the batch of grower's mash, used to feed the Group E ducklings from April, was deficient in some nutrient. This is quite possible, as locally produced feed mixes were very variable in content.

Table 1. Wing length and weight of wild adult and immature (full grown) Whitefaced Ducks, as well as the age, wing length, weight and primary length (P) of the survivors of six groups of ducklings on the last occasion that they were measured.

Age & sex	No.	Winglength (mm) Range and mean \pm SD	Weight (g) Range and mean \pm SD	Month and primary length	
Ad M	5	231-246 (238,6 \pm 4,9)	749-798 (771,8 \pm 15,9)		
Ad F	5	225-242 (235,8 \pm 7,1)	660-796 (732,8 \pm 48,6)		
Imm M	1	242	790	Sep	P = 5
Imm F	1	231	755	Oct	P = 5
Ducklings					
A. 126 d. F	1	238	751	Aug	P = 5
B. 200 d. M	1	238	740	Dec	P = old
C. 123 d.	6	224-240 (234,0 \pm 5,5)	650-760 (713,3 \pm 35,9)	Jun	P = 5
D. 83 d.	5	221 ⁺ -239 ⁺ (227,0 ⁺)	580-645 (611,0 \pm 24,8)	Jun	P = 4
E. 140 d.	3	222-236 (231,0)	545-600 (580,0)	Jun	P = 5
F. 66 d.	3	150 ⁺ -163 ⁺ (154,0 ⁺)	342-382 (367,7)	Apr	P = 3

⁺ = primaries not full grown.

First flight was taken as the occasion when the birds first flew some distance (from near the house to the pond verge, about 40 m), although sustained flight was not attained for a few days after that. Some individuals flew earlier than did others in their group, but all the ducklings first flew at between 77 and 83 days of age, irrespective of their wing length or weight. At that time, wing length was 190-225 mm. Taking wing length at first flight as a percentage of the birds' own full-grown (but immature) wing length, first flight occurred in Group E at 91,7% and in Groups A to C at 93,8% (Group F was not measured at first flight and Groups D and F were not measured when their wings were full-grown). Taking mean length at first flight

as a percentage of mean adult wing length, Group E flew at 89,6% and Groups A to D at 93,5%. These are fairly high percentages for a ground-nesting bird, but flightless ducklings presumably can hide in water under the marsh vegetation to avoid predators.

Discussion

Hanmer *et al.* (1983) showed the development of young Spurwinged Geese *Plectropterus gambensis*; Whitefaced Ducks show some differences. In the goose, the start of feather growth and first flight appeared to be weight-related, rather than age-related and there was a drop in weight just before first flight, which apparently did not occur in the ducks.

Table 2. State of moult or feather growth of adult and immature wild Whitefaced Ducks and ducklings, with month and age in days (=d). Growth of primaries of ducklings (and immatures) scored P = 0 for no primary wing feathers, P = 1 for all pins, P = 2-4 growing and P = 5 only just fully grown. In adults, P = N indicates wing feathers new, but tail still growing. B = X for light body moult, B = XX for heavy moult.

Age & sex	No.	State of flight feathers or primaries (P) and body feathers
Adult M	5	May (1) old, B = XX; Oct (1) new, B = X, (3) newish, B = none.
Adult F	5	Jul (1) P = N, B = X; Aug (2) P = N, B = XX; Sep/Oct (2) new, B = XX.
Imm M & F	2	Sep/Oct P = 5, B = X (both with a brown face, 95-110 days?)
Ducklings		
1	25-28 d	23 P = 0, mantle in pin by 25-28 d. Wing 15-18 mm, weight up to <i>ca.</i> 80 g.
25	<i>ca.</i> 35 d	19 P = 1, mantle feathers out of the sheath. Wing 18/19-35 mm, weight up to <i>ca.</i> 160 g.
35	<i>ca.</i> 48 d	19 P = 2, mantle/flank well feathered; neck rufous <i>ca.</i> 45 d. Wing 35-45mm weight up to 280 g.
48	<i>ca.</i> 65 d	19 P = 3, fairly well feathered all over. Wing up to 150-160 mm, weight up to 420 g.
65	<i>ca.</i> 110 d	16 P = 4. First flight 77-83 d. B = XX from <i>ca.</i> 85 d, with some white on face from 90 d in some; all with some white by 110 d. Group E later than others. Wing almost full-grown, weight up to 650-760 g, except Group E, which had less mass.
110	<i>ca.</i> 180 d	11 P = 5, B = XX with body moult ceasing by <i>ca.</i> 180 d. Most with fairly white face by 120 d and almost adult appearance by 150 d, but with top of the head still greyish. Adult appearance by 180 d.

Hanmer (1985) gave the percentage wing length at first flight of three ducklings as 91% of their own full-grown wing and 89% of the mean adult wing length. This was Group E and at that time I was not aware that this group was in any way different from all other ducklings handled. Further, the wing length of the smallest bird was given incorrectly (as 187 mm, not 190 mm) and later measurements of those ducklings showed their full-grown wing to have become slightly longer than the figures given in that paper.

Brown *et al.* (1982) give the breeding dates for Malawi as February to May. In fact, provided there were good rains in early to mid December, laying occurred from late December. No

ducklings which could have come from eggs laid in June were seen, so late May is probably the end of the breeding season in the lower Shire valley at least.

Brown *et al.* (1982) state that ducklings have an entirely white face (rendering them difficult to differentiate from adults) by 4,5-5 months old (135-150 days). The Nchalo figures are in general agreement with this. However, the wing length and weight of adults given by those authors are considerably less than the figures obtained at Nchalo; even the Group E ducklings were larger. Since the quoted figures were obtained from G Morel, presumably West African Whitefaced Ducks are smaller than those occurring in Malawi.

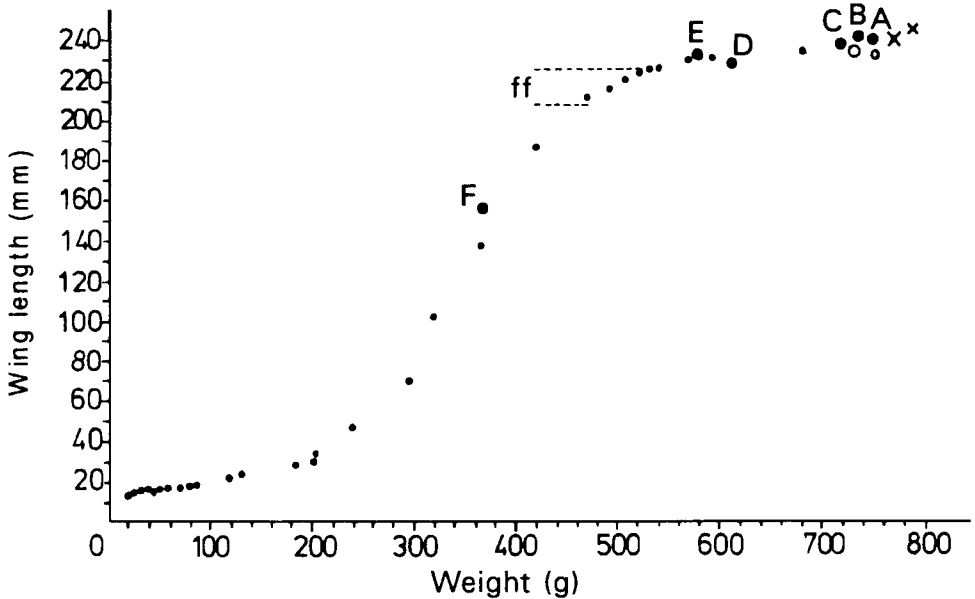


Figure 1. Wing length and weight of Whitefaced Ducks at Nchalo, Malawi. Large closed circles A-F show the mean wing length and weight of the survivors of six groups of ducklings on the last occasion that they were measured. Large X and O show the mean measurements of five wild adult males and five wild adult females respectively and small x and o show the measurements of one wild immature male and one wild immature female respectively; figures from Table 1. Small closed circles show the mean measurements of each group of ducklings at various stages of their development. ff = period during which individual ducklings first flew. Note that Group E birds were fully grown at a much lower weight than were Groups A-C.

No real difference between the sexes is shown in the published wing length figures, although females appear to be slightly longer-winged, whereas Nchalo females were slightly shorter-winged than males.

Brown *et al.* (1982) gives flight feather moult in adults as occurring between May and August in Zambia. The flightless period is probably much the same at Nchalo, although perhaps extending into September. No flightless birds were handled at Nchalo, but the bird obtained in late May had not started flight feather moult (a late breeder?). The July and August birds had completed wing, but not tail, moult while one caught in September and two in October were still moulting contour feathers quite heavily. The other three October birds had completed moult.

The departure of the groups of ducklings occurred when they were 140-150 days old, when all had a fairly white face, but the two singletons remained until they were well over six months old. All the young birds (except A and B) made group flights morning and evening, initially merely circling the pond for a short while and later, just before their final departure flying round the neighbourhood for an hour or so at a considerable height, before returning to spend the hot part of the day and the night on the pond.

The river and marshes were less than a kilometre away and wild birds often overflow the pond or could be heard nearby, but although the ducklings listened to the calls of passing Whitefaced Ducks and frequently replied, they made no attempt to join the wild birds until

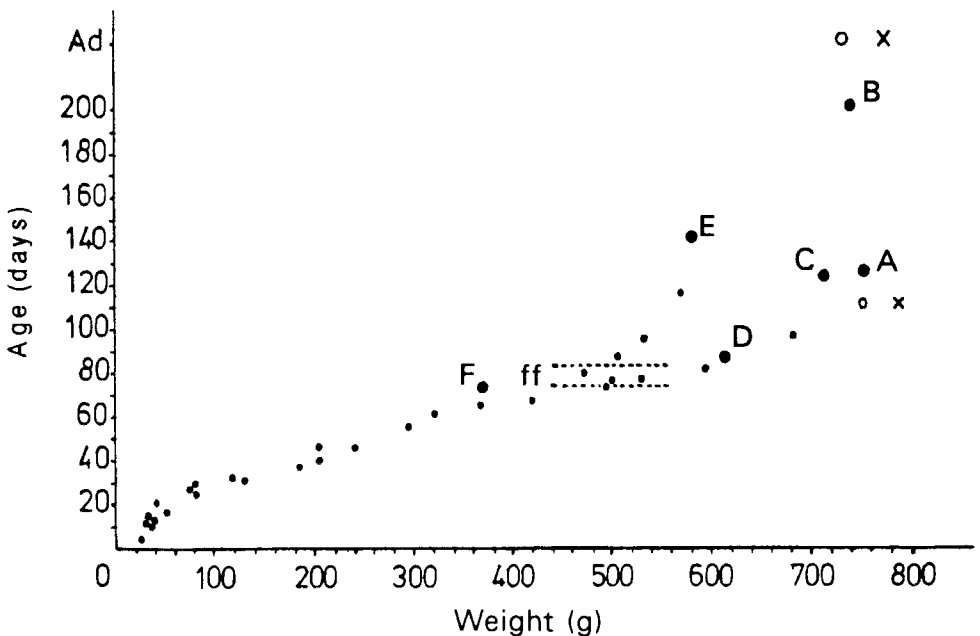


Figure 2. Weight of Whitefaced Ducks with age. Conventions as in Figure 1. ff = age at which all ducklings first flew (77-83 days). Note the different developmental curve of Group E.

the day of their final disappearance when, hearing an approaching flock, they took off with loud whistles and tacked themselves onto the back of the 'V', never to be seen again.

The two singletons took little interest in the calls of passing ducks and seldom made more than a couple of circuits of the pond, morning and evening. The female seemed to think that she was a Muscovy Duck and spent all her time with our flock, but towards the beginning of the next breeding season, suddenly she took off after some wild duck and did not return.

The male appeared to prefer human company and followed me about all day, getting a fair amount of exercise while walking round the mistnets every half an hour; a distance of about 0,5 cm each time. He spent the evening dozing on a chair-back or cushion and, when we had gone to bed, slept on the veranda.

One morning in late December, (aged about 6,8 months), he heard wild birds passing and flew after them. Two hours later he returned, exhausted and slept for the rest of the day. For the following fortnight he exercised, flying round and round the garden, staying in the air for longer periods each day. He also whistled to any wild duck which passed nearby, becoming very excited whenever he saw them. Early one morning in January he rushed outside whistling, took off and circled until a small wild flock drew level, joined one end of the 'V' and was not seen again.

To my knowledge, none of the hand-reared ducklings returned after their departure with a wild flock (apart from B, after his abortive attempt to catch up with some wild birds), but occasionally the night-watchman reported that ducks had spent the night on the pond, leaving at first light. These may have been

hand-reared birds, but could equally well have been wild ones. My experience with both Whitefaced Ducks and Spurwinged Geese (Hanmer *et al.* 1983) suggests that, once integrated with the wild flocks, hand-reared birds become as wild as their companions and remain with them.

A curious incident occurred one evening, when a group of half-grown ducklings (*ca.* 60 days old) were watching a video tape. In fact, the ducklings were not paying much attention and were either preening or dozing, but when the film showed a sequence of lake shore with reeds, marshes and water, all the ducklings sat up and whistled excitedly staring at the TV screen. This occurred twice more, but in intervals between, when no watery habitat was on view, the ducklings settled down again. Unfortunately I did not experiment with those or other groups of ducklings, using a different film, to see if they had the ability to recognise pictures of an aquatic habitat; it is possible that the sound track of the film concerned carried faint calls of the Whitefaced Duck in the background and that it was this which excited the ducklings.

Acknowledgments

Without the assistance and cooperation of my late husband, daughter and house staff, it would have been impossible to raise Whitefaced Ducks in the living room and we would all have missed hours of entertainment.

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