

An ageing guide for the Cape Vulture

S.E. PIPER¹, P.J. MUNDY² AND C.J. VERNON³

¹Department of Surveying and Mapping, University of Natal, King George V Avenue, Durban, 4001, South Africa

²Department of National Parks and Wild Life Management, P.O. Box 8365, Causeway, Zimbabwe

³East London Museum, P.O. Box 11021, Southernwood, 5213, South Africa

Received April 1988; accepted December 1988

ABSTRACT

The Cape vulture is a declining endemic in southern Africa and needs to be carefully monitored. In view of the spatio-temporal separation of the various age classes it is important to record the age of a bird with each sighting. This has not happened in the past as no clear, concise ageing guide was available. Detailed descriptions and photographs are presented of birds of each age class. This is done for seven nestling categories and five age classes of free-flying birds.

INTRODUCTION

The Cape vulture *Gyps coprotheres* is now rare in South West Africa/Namibia (Brown 1985) and has declined markedly in much of southern Africa (Boshoff & Vernon 1980; Mundy 1982). The spatio-temporal distribution, foraging strategy and behaviour of the Cape vulture are directly related to its age (Boshoff & Vernon 1980; Mundy 1982, 1983). Thus it is important to record the location and age of every bird seen; hence the need for a reliable ageing guide. The best ageing scheme is based upon a detailed examination of the individual in the hand, but this is generally not possible nor desirable in most field-based studies. This guide has been devised using only those external morphological characteristics and behaviour patterns which can be seen from afar. There is also a need, among those studying breeding biology, for a guide to ageing nestlings. Reasons for this are (i) to estimate the date of laying from the age class of the nestling, (ii) to monitor nestling mortality as a function of nestling age and (iii) to document changing adult behaviour as the nestling develops.

METHODS

The account presented below is based on the authors' observations and augments Mundy (1973, 1982) and Mundy and Ledger (1975). Field observations consist of 15 man-years of about 200 nests/year to obtain nestling, fledgling, juvenile and adult plumage characteristics. Over 100 visits to roosts were made and about 150 carcass watches were undertaken to collect data on plumage characteristics of immatures and adults. The major age classes used follow those recommended by Mundy (1982, p. 38), i.e. nestling (seven categories), fledgling, juvenile, immature (two categories) and adult. Figures 1 and 2 depict those parts of a vulture that are referred to in the descriptions.

The young vulture, on hatching after 54-57 days incubation (Mundy 1982, p. 165; Robertson 1986), is semi-altricial (Nice 1962) and is confined to the nest for about 139-171 days (Mundy 1982, p. 188; Robertson

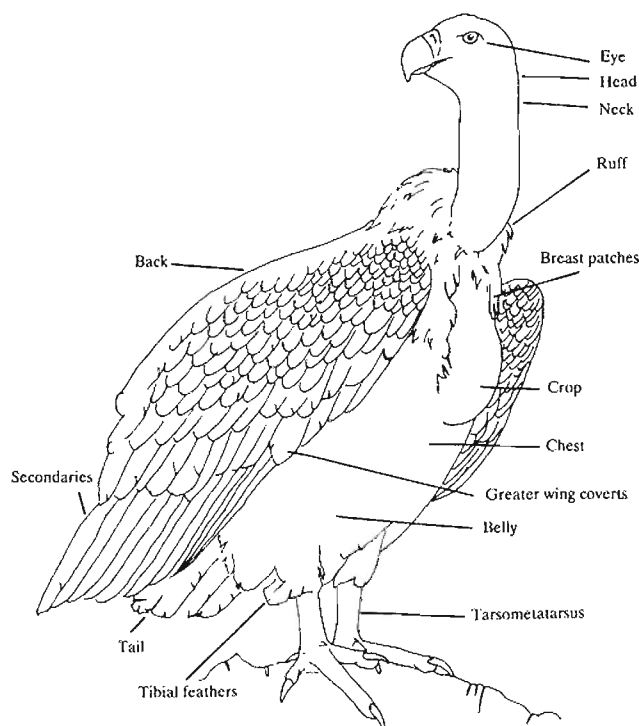


FIGURE 1: Parts of the Cape vulture integument referred to in the text

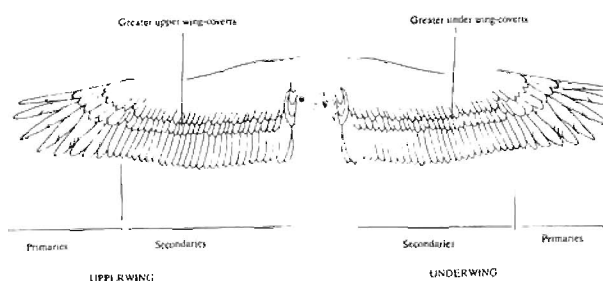


FIGURE 2: Parts of the wings referred to in the text

1986). During this period it is called a "nestling", i.e. a pullus in the nest (Thomson 1985); the term "chick" is rejected as too imprecise as is "eyas" because the latter is more suited to falconry (Campbell & Lack 1985, p. 199).

The most accurate and consistent ageing technique for the growing nestling is measuring the wing length (Mundy 1982, p. 174); however this is a "hands-on" method and not in the spirit of this paper which is based on observations from afar. Therefore an ageing classification has been developed based upon external morphological characteristics and simple behaviour patterns, by noting the date of hatching and the nestling's subsequent development.

Campbell and Lack (1985, p. 218) are followed in defining a fledgling as a young bird taking its first exploratory flights around the nesting site.

Dyck (1985) describes a juvenile as having that "first plumage in which contour feathers are present". However the term is used more restrictively herein: i.e. as "a young flying bird in its first few months of life and still wholly or partially dependent upon its parents for food". The length of the post fledging dependence period is highly variable, lasting up to 210 days or more (Robertson 1985, pers. obs.). Sometimes a juvenile can still be seen begging food from an adult which is attempting to start the subsequent breeding cycle. The juvenile does not beg food from its parents at carcasses, which is a trait of New World vultures (Cathartidae, see Wallace & Temple 1983). This stage may last until the juvenile's parents start breeding again, i.e. up to six months.

The transition from juvenile to immature is imprecise (see Thomson 1985). The working definition adopted here for an immature is "an independent bird but not in adult plumage; that is retaining to varying degrees the juvenile colours and patterns".

NESTLING CATEGORIES

The following seven nestling age classes, and approximate duration associated with each, are proposed (Figure 5, Table 1).

N1: From hatching to 20 days, median 10 days.

Small, white and weak, tends to lie prone in nest, is brooded tightly by adult as though incubating (horizontal position). Nestling is fed by adult lowering its head right down to the nest's floor. Face bluish-green and eye black. The belly shows a remnant yolk-sac (as a bare, slightly protruding, yellowish patch some 50 mm in diameter). Squeaks and calls when left alone.

N2: From 21 to 40 days, median 30 days.

Nestling has second coat of thick white down and appears large and white, the adult broods obliquely with its body at 45° to the horizontal, so revealing the nestling which is often seen. Furthermore the adult frequently stands beside the nest (on guard). Active and sits upright on its haunches (i.e. tarsometatarsi). The egg tooth is lost by about 35 days. Crop when full may be seen to be covered in fluffy white down. Rarely calls when left alone.

N3: From 41 to 50 days, median 45 days.

Black primaries and secondaries appear along the wings of the nestling, along with the appearance of the main dorsal feather tracts. This is the first definitive ageing criterion as these feathers are not apparent before day 40. However the nestling still gives the impression of being more downy than feathered.

N4: From 51 to 60 days, median 55 days.

Feathers starting to appear on the back, chest and tail but no tibial feathers. Folded wing appears scruffy as the good covering of the upper wing coverts have downy tips to the feathers.

N5: From 61 to 80 days, median 70 days.

Tibial feathers appear. Nestling now appears fully feathered. The underwing coverts start emerging. Nestling often sits and is ungainly when it stands. Folded wing has last row of upper coverts appearing as dark with white tips so that the wing appears to have a thin white line running along it.

N6: From 81 to 120 days.

Nestling well co-ordinated, stands with ease and exercises regularly. Has a most conspicuous pale, almost white head in contrast to buff, or brown of the rest of the body. Folded wing is pale in the upper half dark in the lower half. Dark upper wing coverts form a broad line across the wing. They are still separated from the dark primaries and secondaries only by a thin, pale line. Patagial feathers still growing.

N7: From 120 days to fledging.

The bare skin of the neck turns from a greenish-blue to a pink. Patagium becomes fully feathered.

FREE FLYING BIRDS

The following five age categories of free-flying Cape vultures are proposed (Figure 5, Table 2).

The Fledgling

The fledgling phase in the Cape vulture's development is best recognised by the following behavioural clues: fledglings are "unsteady on their wings", making many false and attempted landings, often misreading the updraughts and consequently spending much time flapping vigorously to make up lost height. They may also land in open unprotected places on the ground where one would not expect to see vultures. Fledglings are able to recognise their parents from afar and often start begging when the latter are flying hundreds of metres away. The plumage characters are the same as for the juvenile.

The Juvenile

All the contour and flight feathers on a juvenile are pointed, and this feature is particularly conspicuous for the last row of upperwing coverts, which are both pointed and broadly tipped in white (Figure 3(a)). The

white tips appear as a thin white line along the wing and this line is visible, under good atmospheric conditions, from a distance of hundreds of metres. There is a conspicuous bare patch at the rear base of the neck. The chest and belly appear broadly streaked, and overall the juvenile has a darker appearance than an adult. Figure 4 (a) illustrates the head, neck and ruff of a juvenile bird.

The juveniles are fairly adept at flying, but close inspection shows that they flap more than adults do, and that they are still a little "shaky in the air", especially under turbulent conditions.

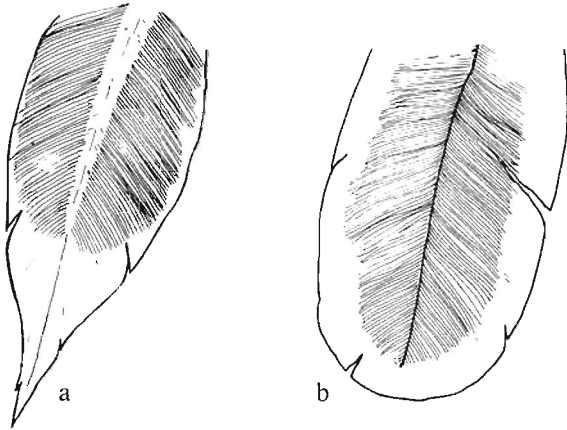


FIGURE 3(a): Juvenile contour/covert feather, pointed and white-tipped, (b) adult contour (covert feather, rounded and broadly edged in white.

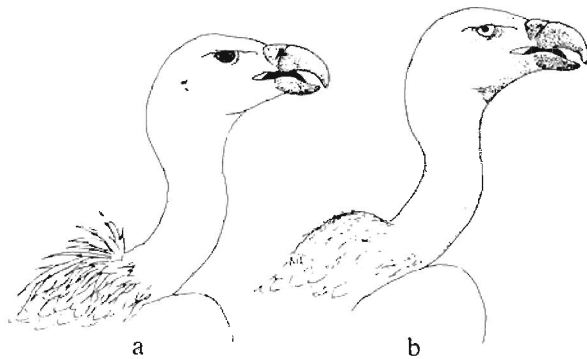


FIGURE 4(a): Head, neck and ruff of a juvenile bird, (b) head, neck and ruff of an adult bird.

The Immature

The immature can be categorised into a young immature and an old immature. The age class begins with the first moult that starts towards the end of the first year (actually one year after the nestling hatches) and ends in the fifth or sixth year. It may vary from individual to individual and with environmental or stress conditions; some captive birds, for example, seem to have unsynchronised or delayed changes.

The Young Immature

The key, or diagnostic features of a young immature Cape vulture are:-

EYE: black, ageing to brown

SKIN ON NECK: bright pink, even red, turning bluish-purple with time

FACE: khaki, but can flush pinkish

HEAD AND NECK COVERING: "cotton-woolish" where it is not bare

RUFF: streaked, buff-coloured feathers, long and lanceolated

BACK FEATHERS: most are dark, pointed with a central white rib and having the tip "dipped as if in white", but newly moulted ones from the end of the first year are round with a broad white edging (Figure 3 (b))

LAST ROW OF GREATER WING COVERTS: a mixture of pointed and rounded, all have moulted by the end of the second year

UNDERWING FEATHERS: the coverts are streaked but with the last row black; the primaries and secondaries appear uniformly black

BREAST PATCHES: wholly pink or red

DISTENDED CROP: white, covered in down.

It is estimated that this age class extends from three-quarters of the way in the first year after fledging to the end of the third year; the head, neck and ruff are similar in appearance to those of the juvenile (Figure 4 (a)).

The Old Immature

The key characteristics are:

EYE: brown changing through orange to yellow

SKIN ON HEAD AND NECK: bluish head with an increase in blue, decrease in pink on the neck, as time passes

HEAD AND NECK COVERING: intermediate between a young immature and an adult

RUFF: starts to disintegrate rapidly to the adult state when the bird is in its fourth year

BACK FEATHERS: after the young immature's moult, all new feathers are conspicuous because they are well rounded without the white tips but instead have a broad white edging (Figure 3(b))

LAST ROW OF GREATER WING COVERTS: as above for the back

UNDERWING FEATHERS: starts to attain adult plumage in third year

BREAST PATCHES: change sometime in this period. This age class extends from the fourth to sixth years, and includes the "sub-adult" class of Mundy (1982, p. 38).

The Adult

The full adult plumage is attained in the bird's sixth, or seventh year. The adult bird is paler than the juvenile though the degree of paleness may vary geographically (A.F. Boshoff pers. comm.); the northern birds are more cinnamon-coloured whereas the birds from the south may be quite white. Colouration also varies with age; older birds are the whitest, especially on the back. The key features to look for are:

EYE: a definite yellow



(a) N1



(b) N2



(c) N3



(d) N4



(e) N5



(f) N6



(g) N7

FIGURE 5: Photographs of the seven nestling categories: (a) N1, hatching – 20 days; (b) N2, 2J – 40 days; (c) N3, 41 – 50 days; (d) N4, 51 – 60 days; (e) N5, 61–80 days; (f) N6, 81–120 days; (g) N7, 120 days – fledging.



(h)



(i)



(j)



(k)

FIGURE 5 CONTINUED: Photographs of the four free-flying age classes: (h) fledgling and juvenile, (i) young immature, (j) old immature, and (k) adult.

TABLE 1: Summary of ageing characteristics for nestlings.

Class	Characteristics
N1	Small, white, weak; lies prone in nest; tightly brooded
N2	Second coat white down, larger; often lightly brooded
N3	Black primary and dorsal feathers appear; still downy
N4	More feathers on back, chest and tail, no tibial feathers
N5	Tibial feathers show; nestling sits; white line on wing
N6	Conspicuous white head; stands; exercises
N7	Bare neck turns from green/blue to pink

TABLE 2: Summary of ageing characteristics for immature and adult birds.

Characteristic	Young immature	Old immature	Adult
Eye	black	brown to orange	yellow
Neck skin	red/pink	bluish	deep blue
Face	khaki		bluish
Ruff	lanceolated	disintegrating	powder puff
Back feathers	pointed & streaked	rounded, not streaked	rounded
Breast patches	red/pink	gets a blue edge	mainly blue

SKIN ON THE HEAD AND NECK: deep blue
 HEAD AND NECK COVERING: sparse and hair-like with a conspicuous bare patch at the rear base of the neck
 RUFF: compact, short, white, looking like a lady's "powder puff" (Figure 4(b))

BACK FEATHERS: broad and rounded with a central black patch near the end in an otherwise white feather, quite distinctive (Figure 3 (b))
 LAST ROW OF GREATER WING COVERTS: as above for the back
 UNDERWING FEATHERS: white coverts with last

row that sometimes shows black spots; contrast between silvery-white vanes of secondaries and their black tips gives appearance of a terminal black line to the secondaries, the white differentiates them from the primaries

BREAST PATCHES: blue with an inner edge of pinkish red

DISTENDED CROP: pale brown.

DISCUSSION

Nestlings can readily be differentiated into three groups, namely those not having primary feathers (N1 and N2), those having primary feathers (N3-N5) and those with a distinct white head (N6 and N7).

Fledglings and juveniles can only be separated on behaviour, the former returning frequently to the nest site. The transition from fledgling to juvenile is not well marked. Free flying birds can be separated into young immature (dark eye and red neck) and adult (yellow eye and bluish neck), while the old immature is intermediate.

The major age classes given above are readily discernible and reference to the detailed descriptions in the text, the tables and figures should help in identifying birds in every age category.

Some observers may confuse the Cape vulture with the smaller whitebacked vulture *G. africanus*, but reference to Mundy (1973, 1982, p. 46), Steyn (1982, p. 21-31) and Maclean (1985, p. 108) should help to distinguish them.

As to the study of breeding Cape vultures and their nestlings an important warning is given:

No observers should ever approach a nesting cliff so closely that they disturb the adults who may then fly off. This is especially important if there are any nestlings less than 40-50 days old as they are vulnerable to predation by black eagles *Aquila verreauxii* and whitenecked ravens *Corvus capensis*; in earlier times some researcher-induced nestling mortality was caused (see Vernon *et al.* 1982).

ACKNOWLEDGEMENTS

We thank the South African Ornithological Society and Vulture Study Group who supported this work, the Endangered Wildlife Trust and Vulture Study Group who gave permission to quote from Mundy (1983); Mrs. J. Lantz and Mr. L.E. Piper who word-

processed earlier drafts of the manuscript and Mr. D.M. Butchart who drew the figures.

Mr. and Mrs. H. Scott of Larvon Bird Gardens, Harare, Zimbabwe; Mr. and Mrs. R. Friedman of Magora, Halfway House, Transvaal and Mrs. I. Mellet of the Centre for the Rehabilitation of Wildlife, Durban, Natal, South Africa are all thanked for allowing us to handle captive birds year after year. To those many people who have assisted us in the field we extend our thanks. We thank Dr. A.F. Boshoff, Mr. A.S. Robertson and the editor for commenting on an earlier draft.

REFERENCES

- BOSHOFF, A.F. & VERNON, C.J. 1980. The past and present distribution and status of the Cape Vulture in the Cape Province. *Ostrich* 51: 230-250.
- BROWN C.J. 1985. The status and conservation of the Cape Vulture in SWA/Namibia. *Vulture News* 14: 4-15
- CAMPBELL, B. & LACK, E. (eds.). 1985 A dictionary of birds. Calton (U.K.): Poyser.
- DYCK, J. 1985. Plumage. In: Campbell, B. & Lack, E. (eds.). A dictionary of birds. Calton (U.K.): Poyser: 470-472.
- MACLEAN, G.L. 1985. Roberts' birds of southern Africa. Cape Town: John Voelker Bird Book Fund.
- MUNDY, P.J. 1973. On the Cape and White-backed Vultures. *Honeyguide* 76: 10-17.
- MUNDY, P.J. 1982. The comparative biology of southern African Vultures. Johannesburg: Vulture Study Group.
- MUNDY, P.J. 1983. The conservation of the Cape Griffon Vulture of southern Africa. In: Wilbur, S.R. & Jackson, J.A. (eds.). Vulture biology and management. Berkeley: University of California Press: 57-74.
- MUNDY, P.J. & LEDGER, J.A. 1975. Notes on the Cape Vulture. *Honeyguide* 83: 22-28.
- NICE, M.M. 1962. Development of behaviour in precocial birds. *Trans. Linn. Soc. N.Y.* 8: 1-211.
- ROBERTSON, A.S. 1985. Observations on the post-fledging dependence period of Cape Vultures. *Ostrich* 56: 58-66.
- ROBERTSON, A.S. 1986. Notes on the breeding cycle of Cape Vultures (*Gyps coprotheres*). *Raptor Research* 20: 51-60.
- STEYN, P. 1982. Birds of prey of southern Africa. Cape Town: David Philip.
- THOMSON, A.L. 1985. Young bird. In: Campbell, B. & Lack, E. (eds.). A dictionary of birds. Calton (U.K.): Poyser: 667-668.
- VERNON C.J., PIPER, S.E. & SCHULTZ, D.M. 1982. The breeding success of the Cape Vultures at Colleywobblies, Transkei in 1981. *Vulture News* 8: 26-29.
- WALLACE, M.P. & TEMPLE, S.A. 1983. An evaluation of techniques for releasing hand-reared vultures to the wild. In: Wilbur, S.R. & Jackson, J.A. (eds.). Vulture biology and management. Berkeley: University of California: 400-423.