ARTICLES

Lagging – publication trends in Afrotropical vultures

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Summary

Publication trends covering Afrotropical vultures over the six decades 1950-2009 are examined. Overall, from a low base in the 1950s, there was a rapid acceleration in publications through the 1960s to the 1980s, followed by relative stagnation in the 1990s, after which publication rates again accelerated. The Cape Vulture *Gyps coprotheres* shows the most marked stagnation in publication rate in recent decades, especially relevant to a unique and marked peak in the 1980s. Publication rates covering the Afrotropical populations of the Egyptian *Neophron percnopterus* and Bearded *Gypaetus barbatus* vultures are increasingly lagging behind those of the extralimital (Eurasian) populations of these species. Growth in publications on the Afrotropical population of the Bearded Vulture evidences particular sluggishness recently. There are strong indications that publications, and hence likely research effort and perhaps even conservation action, on Afrotropical vultures are falling ever further behind those on vultures elsewhere in the Old World.

Introduction

This article set out to briefly review publication trends covering the vultures of the Afrotropical region. The primary source of information in this regard is a global internet-based bibliography dedicated to diurnal

birds of prey.

The implicit assumption behind this investigation is that publication rates are a fair reflection of research, and perhaps even conservation, effort relevant to the subject matter.

Methods

The Global Raptor Information Network ('GRIN') is an internet-based initiative (see: http://www.globalraptors.org/grin/indexAlt.asp) associated with The Peregrine Fund based in the United States of America. GRIN is designed to promote information transfer relevant to biologists studying diurnal birds of prey. A central feature of GRIN is a searchable bibliography of publications related to diurnal raptors. This bibliography boasted just over 53 000 entries in August 2012 and includes formal scientific papers in the peer-reviewed literature, semi-popular to popular literature such as magazine and newsletter articles, published conference proceedings, academic theses, and books and book chapters/entries. It does not include unpublished reports and electronic web-based material.

References related to nine focal vulture species that occur in the Afrotropical region (as defined by Dowsett & Forbes-Watson 1993) were extracted from the GRIN bibliography as part of a review of the conservation status of these birds in this region. These nine species are the Cape *Gyps coprotheres*, Rüppell's *G. rueppellii*, African White-backed *G. africanus*, Lappet-faced *Torgos tracheliotos*, White-headed *Trigonoceps occipitalis*, Hooded *Necrosyrtes monachus*, Egyptian *Neophron percnopterus*, Bearded *Gypaetus barbatus* and Palm-nut *Gypohierax angolensis* vultures. For comparative purposes, references covering two additional vulture species, Griffon *G. fulvus* and Oriental White-backed *G. bengalensis* vultures, were also extracted. The references extracted from the GRIN bibliography were imported into a Microsoft Excel spreadsheet for sorting and to generate the numerical information and graphs presented here.

During the course of the review of the conservation status of the nine Afrotropical vultures mentioned above, some, but relatively few, additional references pertaining to these species in the Afrotropics were gleaned from other sources. These were added to the bibliographic database prior to the analysis. Three of the focal species, Lappet-faced, Egyptian and Bearded vultures also occur widely outside the Afrotropics

and the references relevant to these were separated during the analysis into publications pertaining to the Afrotropics and to areas extralimital to this region.

This analysis focuses on information covering the six decades from 1950 to 2009.

Results

The GRIN bibliography yielded 2261 references pertaining to the nine focal species, i.e. some 4% of the GRIN bibliography on diurnal birds of prey covers these species. A total of 172 additional references on these species not in the GRIN bibliography and gleaned from other sources were added, bringing the aggregate to 2433 references, i.e. the entire bibliography was only bolstered by some 7% by the inclusion of this additional material.

Of course, many individual references include information on more than one of the nine focal species and therefore the total coverage of these species in the 2433 references is 4249 instances (of which 2938 refer to the Afrotropics), i.e. an average of 1.7 species is covered in each publication (Appendix 1).

The appearance of publications dedicated to, or at least materially including, the nine focal vulture species, indeed Old World vultures generally, is a relatively recent phenomenon essentially rising from a negligible base in the first decade examined, the 1950s. The numbers of publications for most of the relevant species during the 1950s reflect single-digit numbers. This includes the Griffon Vulture with only seven references in the GRIN database for the period 1950-59 (Appendix 1). The only exception is the Bearded Vulture which had 12 references, the only time it was ever to lead the other species in this regard. Looking at the period prior to 1950, there are only 71 references in total in the GRIN bibliography for the focal species dating back to the mid-1800s, less than one per annum on average, compared with an average publication rate of 190 per annum in the first decade of the 21st Century. This means that virtually all the literature on these species has been produced during the lifetimes of the more elderly vulture biologists still alive today.

After the 1950s there was a rapid acceleration in publications covering the focal species through the 1960s, 1970s and 1980s. Over these three decades, the number of publications more than doubled every decade, from 60 in the 1950s, to 130 in the 1960s, 368 in the 1970s and 854 in

the 1980s. Strangely, there was sudden stagnation in Afrotropical vulture publications in the 1990s, when the number rose from the previous decade by less than a paltry 10% to 935. The first decade of the new century, however, again reflected a doubling of publications, to 1902, compared with the previous decade, although the ground 'lost' in the 1990s was not recuperated.

Gyps *vultures*

Figure 1 depicts publication trends for the relevant *Gyps* vultures, including the Griffon and Oriental White-backed vultures for comparative purposes. The most striking feature of this graph is the unique pattern displayed by the Cape Vulture, which shows obvious stagnation, indeed during the 1990s a strong decline, in publications following a marked peak in the 1980s. In the latter decade, the Cape and Griffon vultures featured in roughly equal numbers of publications (188 and 181 respectively) and vied as the two Old World vultures attracting the most research attention. Subsequent to this, however, publications on the Cape Vulture waned decidedly in the 1990s, more so than for any other Afrotropical vulture population examined in this study (Appendix 1). Publication output picked up again only sluggishly in the decade to follow but still failed to match the research output of the 1980s, a situation unique among all the vulture species examined here. By contrast, publications covering the Griffon Vulture continued to increase through the 1990s and showed a dramatic leap through the first decade of the 21st century. By this time publications on the Griffon Vulture outstripped those on the Cape Vulture more than threefold. In the last decade examined, both the African White-backed Vulture and Afrotropical populations of the Lappet-faced Vulture had overtaken the Cape Vulture in terms of publications generated (Appendix 1).

Turning to the other two Afrotropical *Gyps* species, both Rüppell's and African White-backed vultures have shown a constant increase in publications since the 1950s, with particular acceleration in the most recent decade examined. The Oriental White-backed Vulture shows a similar pattern, although it evidences a lag in publications during the 1990s (Appendix 1). This species has come off a particularly low base to rival, indeed overtake, Rüppell's Vulture in terms of research interest. This is not surprising given the tragic

and well-publicized 'Asian vulture crisis' that played out in the 1990s (Pain *et al.* 2008).

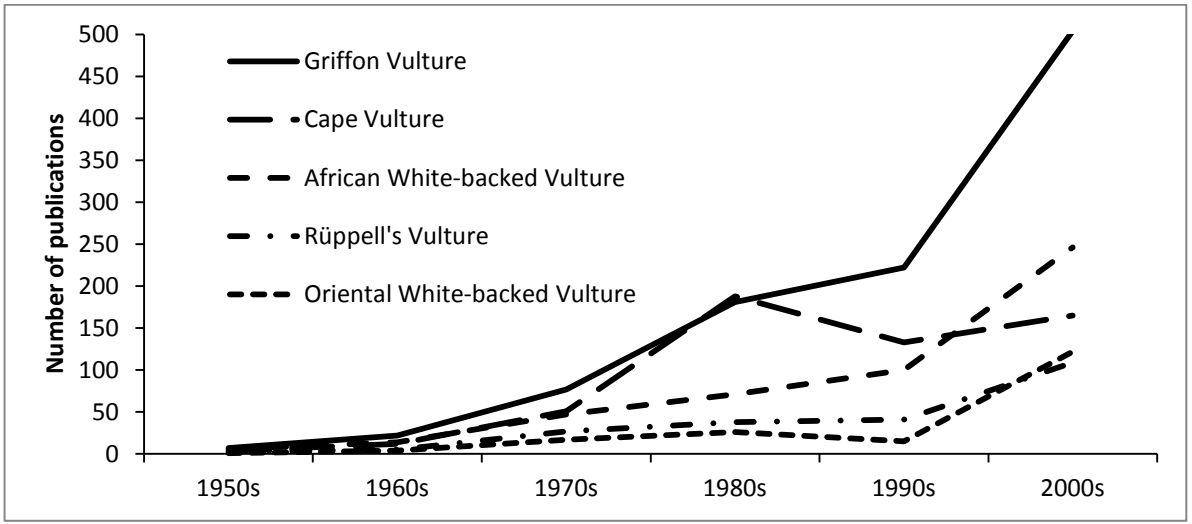

Figure 1: The total number of references covering the Griffon, Cape, African White-backed, Rüppell's and Oriental White-backed vultures in each of the six decades 1950 – 2009.

Other vulture species

Of the remaining six focal species, the Lappet-faced, Egyptian and Bearded vultures also occur widely outside the Afrotropics, especially the last two species. The most striking feature of the trends shown for these three species (Figure 2) is the difference in the patterns of publications shown relevant to the Afrotropical versus extralimital populations of these three species, particularly relevant to the Egyptian and Bearded vultures.

For the Egyptian Vulture, the publication rate remained fairly equal comparing the Afrotropical and extralimital populations between the 1950s and 1970s (Appendix 1). Subsequent to this, in the 1980s and 1990s, the publication rate covering extralimital populations doubled relative to Afrotropical populations and increased to threefold during the most recent decade examined. A similar but even more marked pattern is shown by the Bearded Vulture information, with the divergence starting a decade earlier and being even wider by the first decade of the 21st Century, i.e. over fourfold. The centre of gravity relevant to publications on these two species, originally fairly evenly distributed between the Afrotropics and elsewhere in the range during the 1950s to 1970s, had move squarely to the extralimital populations by the new century.

The Lappet-faced Vulture, which occurs only relatively marginally outside the Afrotropics, shows an unsurprisingly contrasting pattern, with the overwhelmingly spatially dominant Afrotropical population receiving consistently greater publication exposure compared with the localized extralimital outliers. The relative stagnation in publications covering extralimital populations since the 1980s probably reflects, at least partially, the local extinction of the breeding population in Israel, which had attracted extensive attention prior to its loss, by the early 1990s (Ferguson-Lees & Christie 2001). This suggestion, however, is not central to the focus of this analysis.

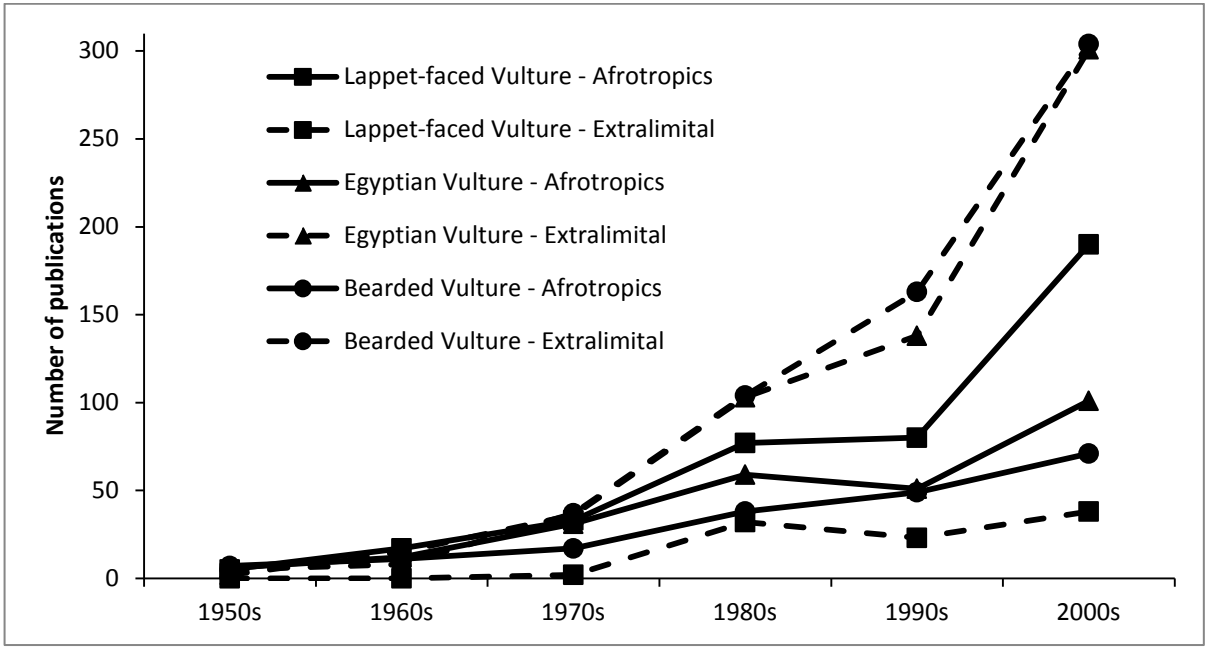

Figure 2: The total number of references covering the Lappet-faced, Egyptian and Bearded, vultures in each of the six decades 1950 – 2009. The information has been separated to reflect publications pertaining to the Afrotropics and to areas extralimital to this region.

The remaining three focal species, the White-headed, Hooded and Palm-nut vultures (Figure 3), all restricted to the Afrotropics, show similar patterns to those evidenced by Rüppell's, African White-backed and the Afrotropical populations of Lappet-faced and Egyptian vultures, i.e. fairly steady increases in publications since the 1950s, with particular acceleration in the most recent decade examined (Figures 1-3).

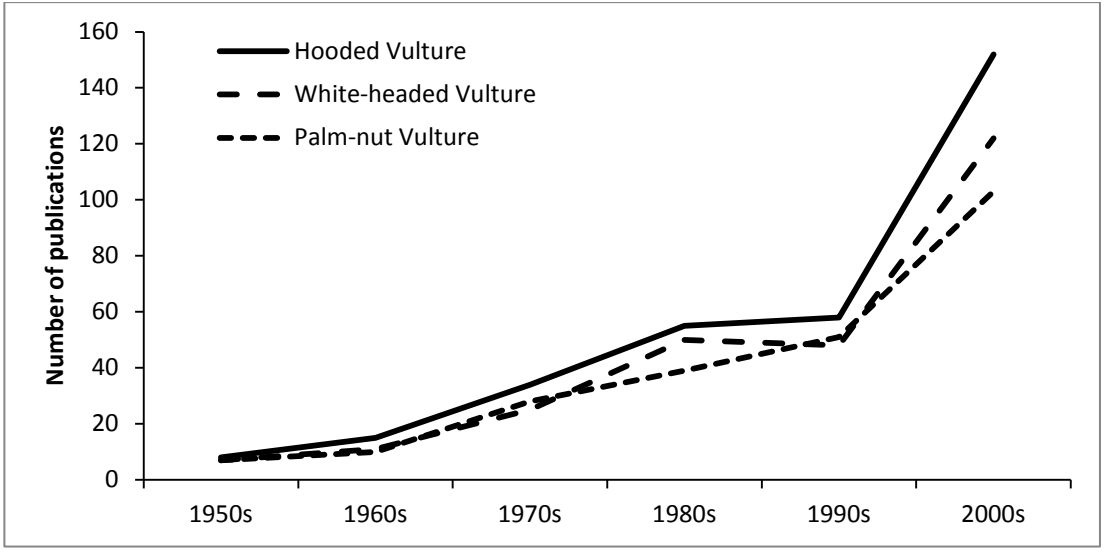

Figure 3: The total number of references covering the Hooded, White-headed and Palm-nut vultures in each of the six decades 1950–2009.

The information for the Afrotropical populations of the Bearded Vulture differs in failing to show any marked acceleration in publication rate in the last decade inspected, i.e. a fairly steady increase throughout (Figure 2).

The White-headed, Hooded and Afrotropical populations of Lappet-faced and Egyptian vultures all evidence the relative stagnation, and even decline in some instances, in publication rate during the 1990s mentioned at the beginning of this section and most marked amongst Afrotropical vulture populations in the case of the Cape Vulture.

Discussion

As mentioned in the introduction, a comparative analysis such as this rests on the assumption that publication rates accurately track research effort. This is likely a fair assumption and although much useful research work remains unpublished, there is little reason to expect that any such biases are not uniform across time, region and species. Perhaps more important is whether or not formal research output reflects conservation effort. This again is likely a reasonable assumption, if one mandating greater scrutiny.

It would also be a fair comment that not all publications are equal in terms of their 'value'. The publications included here range from minor short notes documenting relatively trivial observations to lengthy tomes detailing voluminous information. But again it can be expected that this bias should be fairly even across the dataset. To attempt any 'weighting' of publications would be challenging. But this is not to say that such an endeavour would not also be both feasible and insightful. Such weighting could be based on examining the number of pages spanned by each publication, readership statistics, citation rates, and other such related measures (some of which contain their own separate potential biases).

A further assumption is that the GRIN bibliography, which forms the foundation of this analysis, is fairly comprehensive and not materially biased in terms of time, region and species covered. An independent search for relevant literature on the focal species only unearthed an additional 7% of references compared with GRIN, which suggests that the latter is

relatively comprehensive. That this bibliography was independently compiled in the New World (USA), where none of the relevant species occurs, also suggests that there is little reason to expect it to be biased relevant to any regions within the Old World. The same might not be expected of a bibliography compiled from a base in say Spain, India, Kenya or South Africa, as examples.

Conclusions

This cursory analysis of publications on Afrotropical vultures reveals several interesting, conservation-relevant and, at least from an Afrotropical perspective, disturbing features. The three apparently key findings of this review are outlined below.

1) Publications, and hence likely research effort and perhaps even conservation action, on the vultures of the Afrotropics is lagging behind that elsewhere in the Old World, as evidenced by the stagnation in the growth of publications on the Cape Vulture compared with the Griffon Vulture, and when comparing publication rates covering Afrotropical versus extralimital populations of the Egyptian and Bearded vultures. It is possibly germane to note that the Cape Vulture, concomitant with its 'publication lag', is decreasing and is currently listed as globally threatened ('Vulnerable'), whereas the Griffon Vulture, now the best studied species in the Old World, is increasing and is globally listed as 'Least Concern' (BirdLife International 2014).

2) The situation in this regard is particularly worrying relevant to the Cape Vulture, a globally threatened species endemic to the (southern) Afrotropics and with a relatively small range and population size. The reasons underpinning this publication pattern relevant to the Cape Vulture are only a matter of conjecture without deeper investigation. It may be associated with the history of the southern-African based Vulture Study Group, which was formally established in 1977 (Mundy *et al.* 1992). This group, at least initially, targeted its efforts primarily at research on, and the conservation of, this species. *Vulture News*, of course, started as the formal journal of the Vulture Study Group, although it is now the

formal journal of the Vulture Specialist Group of the International Union for Conservation of Nature (IUCN). It seems certain that the uniquely steep growth, for the time, in publication output on this species reflected by the marked peak in 1980s was associated with the activities of the Vulture Study Group. It might be argued that this early acceleration should not have been expected to have been sustained subsequently. Consequent growth, in the first decade of the 21st century, however, also proved sluggish. This suggests that a deeper malaise manifested, especially considering the steep increases, resembling those of the Cape Vulture in the 1980s, shown by most of the other species during this most recent period (Figures 1-3).

3) The lack of any marked acceleration in the output of publications on the Afrotropical population of the Bearded Vulture in recent times is also cause for concern and this species reflected the lowest publication rate of all Afrotropical vulture populations in the most recent decade examined. This species has been recently reclassified from 'Least Concern' to 'Near-threatened' globally (BirdLife 2014).

With these apparent deficiencies identified, appropriate responses would be to investigate their causes and to take action to rectify them. The reasons for the ostensible stagnation in Afrotropical vulture publications generally in the 1990s would be particularly worthy of further investigation to ensure that such a situation does not recur.

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Keywords: Afrotropics, literature, references, vultures

Appendix 1: The total number of references covering each of the 11 vulture species discussed here in each of the six decades 1950 – 2009. CV = Cape Vulture, RV = Rüppell's Vulture, AWBV = African White-backed Vulture, WHV = White-headed Vulture, HV = Hooded Vulture, PNV = Palm-nut Vulture, LFV = Lappet-faced Vulture, EV = Egyptian Vulture, BV = Bearded Vulture, GV = Griffon Vulture, OWBV = Oriental White-backed Vulture. Information for the Lappet-faced, Egyptian and Bearded vultures has been separated to reflect publications pertaining to the Afrotropics ("Afr.") and to areas extralimital ("Extr.") to this region.

Decade	CV	RV	AWBV	WHV	HV	PNV	LFV Afr.	LFV Extr.	EV Afr.	EV Extr.	BV Afr.	BV Extr.	Totals excl. Extr.	Totals* incl. Extr.	GV	OWBV
1950-59	4	3	6	7	8	7	5	0	6	2	7	5	**53**	60	7	1
1960-69	12	5	14	11	15	10	17	0	12	15	11	8	**107**	130	22	4
1970-79	51	27	47	25	34	28	33	2	31	36	17	37	**293**	368	77	17
1980-89	188	38	71	50	55	39	77	32	59	103	38	104	**615**	854	181	26
1990-99	133	41	100	48	58	51	80	23	51	138	49	163	**611**	935	222	15
2000-09	165	109	246	122	152	103	190	38	101	301	71	304	**1259**	1902	504	122
Totals	**553**	**223**	**484**	**263**	**322**	**238**	**402**	**95**	**260**	**595**	**193**	**621**	**2938**	**4249**	**1013**	**185**

* - excludes Griffon and Oriental White-backed vultures

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