



Cape Vulture (*Gyps coprotheres*) breeding monitoring protocol

Introduction

The Cape Vulture (*Gyps coprotheres*) is southern Africa's only endemic vulture species and is listed as *Endangered* by the IUCN 2015. More recently, the Cape Vulture has been classified as an appendix CITIES I species. Notwithstanding it being the most studied vulture in southern Africa and being the central focus of vulture conservation in southern Africa, it has shown a consistent and continued decline with range contraction.

This document sets out in a simple and step-by-step programme to initiate and maintain a breeding monitoring programme for cliff nesting vultures. It is important to keep a consistent approach to monitoring so population trends can be monitored over time, results analysed and sound conservation strategies put in place to halt and reverse declines.

A minimum of 2 people is required for each count. This practice is important to reduce errors of counting. Each nest should be seen by both people as this is used to cross-check all observers.

Overview of protocol

To monitor cliff nesting vultures, it is important to locate at least one viewpoint from which one can see most, if not all of the nests. More often than not, multiple viewing points are required. From each view point, a set of photographs needs to be taken and all the nests need to be marked on the photograph and numbered, each with its own unique number. It is recommended to take new photos every five years approx., as whitewash and vegetation may change over time, which makes feature / nest identification more difficult. Ideally images should be taken using the same lens, body, focal length etc, so that images can be overlaid with nest layers. Thereafter each nest can be referred to by its unique number which will remain with that nest for life. A breeding colony needs to be visited three times per breeding season (whenever possible) to be able to count:

- the number of breeding pairs in May,
- the numbers of nestlings in July/August,
- the number of fledglings in September/October,

With this data, one can estimate the number of pairs that attempt to breed followed by their breeding success.

To understand the dynamics of conservation and monitoring at a vulture breeding colony, it is useful to have as much background information as possible for that colony.

Before proceeding, it is important to note that this 'background information collecting phase' can start before, or continue after the more important aspects of colony monitoring sessions.

The important questions to answer for any breeding colonies are:

1. Has this colony ever been visited or monitored before, and if so, how many birds, pairs, nests and fledglings were counted on each visit?
2. Has anything ever been published on the colony?
3. Have the number of breeding pairs at this colony shown any long-term trends, e.g. increase or decline?
4. Have the vultures ever abandoned this colony only to return at some later date? (This is called 'colony switching'.)
5. Have dying or dead birds ever been found at this colony, or in the near vicinity?
6. In the vicinity of the breeding site is there any evidence of poisoning, drowning, persecution, electrocution or collision with power-lines or other structures?
7. Is the colony within a conservation area? If so, is it part of a conservation or management plan?
8. Has the colony ever been part of an environmental impact assessment?

It is probable that in the vicinity of the colony there will be people who have taken an interest in the vultures over the years, these are likely to include landowners, farmers, employees of Nature Conservation agencies, teachers etc. These people need to be located and interviewed.

Most of the colonies are on private land with a only a handful in reserves. If available contact details and relevant information for each colony will be given to you before you head out into the field. You will be trained before the monitoring so you feel comfortable and suitably prepared. Arrangements for site visits, monitoring and accommodation on site will be prepared beforehand and this information will all be shared with you.

Equipment

Good quality equipment is essential for monitoring. You will be staring through a scope for hours on end so poor quality will affect your eyes, give you headaches and make the process uncomfortable and laborious. However, if you have high definition and clear equipment, monitoring is fun, accurate and an opportunity to enjoy the birds in their own environment, learning their behaviour and an opportunity of visiting and enjoying some of the most beautiful places.

We recommend a 20–60x 88mm spotting scope from reputable brands for each monitor together with a good heavy tripod which can handle heavy winds. In this case, price often determines quality and we recommend the more expensive brands as your eyes are worth the best. The same goes for tripods as light tripods will not handle heavy winds and you need the weight for accuracy and stability. A laptop where the screen is visible in the field during day light hours and either an inverter or car charger to charge your laptop. A clipboard where you can lean on for writing on data sheets and 3 or more pens and different colours so as each observer can have their own colour. In this way it is easier for cross checking each other.

It is also handy to have a camera with a good strong lens (200 – 400mm), however we are aware this is not always possible. Thus, if additional photos are needed and you do not have a camera, just make a note and location of where the photo is needed.

Each viewing site has plotted co-ordinates to make sure the correct viewing site is always used. Thus we urge monitors to have a handheld GPS with extra batteries or your cell phone with GPS enabled so you can get to the correct monitoring viewing site. Whilst using your cell phone, please also make sure you have a car charger for your phone. You can also use USB phone chargers now through your laptops.

Lastly, hat, sunscreen, snacks, lots of water, passion, a sense of humour and patience goes a long way during the long hot hours.

Monitoring

There are three important elements to monitoring a Cape Vulture breeding colony: documenting its physical characteristics, recording the number of breeding pairs and success, which helps determine what threats the particular site may be facing.

Documenting the breeding site – physical characteristics

There are five aspects of a breeding colony which needs to be documented: site description, land tenure, physical features, bioclimatic characteristics and land-use patterns. Once you have the data, check that the supplied information is reasonably correct by ground truthing the data. The data required is listed in the table below:

The physical characteristics of a Cape Vulture breeding colony or roosting site.

Entry	Essential?	Description
Site description		
Name	Yes	Please use the name supplied from the <i>Site Register</i> unless one does not already exist.
Region	Yes	Please use Country or Provincial codes
Co-ordinates	Yes	Record the co-ordinates as south and then east in the format: Dd.ddddd i.e. -30.654865°S 26.968427°E
Locality	Yes	Say in your own words where the site is and how to get there. Mention any particular permits needed, dangerous dogs (or farmers) etc.
Photographic record		List the names of persons who have photographed the cliff faces and give file names etc, if known. Old photographs may be particularly important as a source of historical information.
Land tenure	Yes	Who owns or controls the land, e.g. private farmer, communal land etc.
Physical features		
Altitude		Height of the top of the cliffs, metres above sea level
Geology		E.g. Sandstone
Geomorphology		E.g. Sheer cliff above river gorge.
Faces		E.g. a series of separate faces
Aspect		The general direction in which the site faces.
Face height		From the top of the face to the scree

		slope below.
Dispersion		Describe how the nests are dispersed about the face, e.g. scattered in clumps of 2 or 3.
Bioclimatic		
Vegetation		
Bio-climatic region		(Only defined in KwaZulu-Natal)
Climatic regime		E.g. winter rainfall
Rainfall		E.g. About 650 mm p.a.
Wind regime		E.g. south-east in summer
Frost and snow		E.g. occasionally during the winter
Land-use patterns		
Immediate	Yes	Within 5 km, e.g. commercial farms, all pastoralist
Intermediate	Yes	Between 5 and 25 km, e.g. about 50% commercial farms, as above and about 50% communal lands, some cultivation, low live stock density
Distant		Beyond 25 km: e.g. 30% commercial farms, 55% communal lands (both as above) and 15% urban.

Photographing the breeding colony

For each colony, every nest at a breeding colony needs to have a unique identifier so that it can be tracked through time. There are several step procedures to do this:

1. Go to the best viewing point for each named section of the breeding cliff and take one or more photographs of the ledge, if this is possible. Each photograph should be at a sufficiently large scale so that individual nests can be clearly seen.
2. It is best to take the photographs at the start of the breeding season when the birds have finished, or nearly finished nest building. At this time it is usual for one bird of the pair to be standing on the nest and this makes the nest more visible.
3. The best photographs are taken at the time of day and in the weather conditions similar to what you will be monitoring in so that the photograph will resemble what you are likely to see when you are monitoring. It is not possible to arrange the weather, in advance, for photography! But the best photographs are taken on a lightly overcast day with no direct sunlight. Ideally, the whole cliff, including the ledges, caves and potholes should be equally lit. Taking the photographs the day after a light rain can enhance their resolution as the air will be clearer. Avoid taking documentary photographs in late winter or spring when the citizens of southern Africa, all of whom have arsonist tendencies, are burning the grasslands as this creates an impenetrable haze.
4. When photographing a site first take one or more overview pictures showing all, or most, of the colony. Then take a series of OVERLAPPING photographs of each cliff. This is important because the first time you scan a cliff it is likely that you will miss some sections which might later be utilized.

5. Once you have selected the photographs you are to use in the field a) have them printed as large as possible to fit on an A4 sheet and b) have them available on a photoshop software computer package where you can zoom into the photo.
6. A) Carry your photographs in the field in a small concertina file so that all the photographs pertaining to a single face are kept together and staple the data sheets to each photograph! B) Make sure your computer is fully charged and the files are either on your laptop hard drive or external hard drive. Always keep a backup! Also make sure you are able to charge your laptop as you will be out in the field for hours and need access to your laptop should you choose to use a software package rather than printed photographs.

Colony census

The primary purpose of the colony census is to record the contents of each and every nest and so deduce what breeding activity is taking place. It is essential that each and every nest be numbered and that the activities are recorded for each nest accordingly so that comparisons can be made between successive visits. The following step-by-step procedure is recommended.

1. Take your nest-record photographs, telescope, tripod, sun block lotion, etc. and get to the first view site as soon as possible in the morning. Set up and scan the breeding cliff and take out the appropriate photographs and data recording forms. Scan the cliff to ensure that there are no nests on the cliff which are not on your photographs. If there are sections of the cliffs newly in use, then make a note to photograph them later or if the light allows, photograph straight away and add them onto your database.
2. Use your telescope to record the nest contents as best you can, it is often easiest to write in the activity codes as shown in the table below. Each of these codes is clearly defined in this table.
3. Once you have finished the census of each section of the cliff fill in the totals at the bottom of the data form. Then scan that section of the cliff again and perform a visual check to make sure that you have not missed anything.

List of nest contents codes

Code	Meaning
A	Adult at the nest
B	Adult brooding, usually sits slightly elevated at 15° to 45° to the horizontal, sometimes the nestling can be seen under the adult.
C	Nestling in the nest (we no longer use the term 'chick' as it is too imprecise)
D	Dead bird in or close to the nest
E	Egg in the nest, often only seen when the adult rises up to turn it.
F	Fledgling
H	Nest is hidden, i.e. you can see or infer that a nest is there but the contents are not visible.
I	Incubating = a bird sitting tight on an egg in the nest. An incubating adult usually sits horizontally on nest but may rise up occasionally to roll the egg or to sit in another position.
K	Population, usually at or on the nest

L	Lost nest, there was a nest at the site on a previous visit but it is no longer visible, and whitewash has gone.
R	Ringed nestling or fledgling seen at the nest
T	Tenanted nest, one or more adults standing on or close to the nest as if to demonstrate that they are holding the site
W	Working i.e building a nest or working on or with its nest
Z	Ringed, or marked adult at nest
?	Code, or observation uncertain
-	Nest present but no other activity

A blank census form is attached (Annexe 1) and is also available as a MS Excel file

Once you have completed the census for a face you need to add up the totals for that visit: Use only one code for a nest. i.e. do not give a single nest T, K and W, choose the most relevant one only for the breeding session. i.e during May I would be more relevant than T but in August, C would be more relevant than T.

- **Tenanted:** Number of nests with a single adult, or a pair at the site.
- **Incubating:** Number of nests with an adult sitting tight on the nest.
- **Nestlings :** Number of chicks definitely seen.
- **Fledging :** Number of fledglings definitely seen.
- **Hidden:** Number of nests hidden based on birds' behaviour
- **Working:** Number of adults working on their nests but which are not incubating etc.
- **Copulating**
- **Active nests:** Total of all the above for each monitoring phase

For each cliff face or sector (photo) a separate form must be completed, as per the sheet on the next page

Entering photos and data on the computer

Every year, photos and data must be entered according to that year. This means you need to save each file and document with the year in addition to the original file name i.e F4Manutsa.IMG2018/Sept. This is vital as often nest are added to the photos with each new breeding season and each year needs to reflect this. A folder for the year monitored also needs to be opened and all images for that year saved into that folder. Ideally this should be done at the start of the breeding survey and when you open each photo, before closing it, you save it into the new folder with the new year and date.

It is super important to get this right as confusion comes when photo are not saved to respective years but nests added and the correct year is not reflected accordingly. This is as important as undertaking an accurate survey.

Cape Griffon Colony Census Form

Colony:

Time:

Sector:

	Visit 1	Visit 2	Visit 3
Nest/Date			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
Hidden			
Tenanted			
Incubating			
Fledglings			
Brooding			
Nestlings			
Active Nests			