



## **Southern African Tree Nesting Vulture Survey Protocol**

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*An African white-backed Vulture tends a nest with a young chick in Botswana.*

## Introduction, Method Justification and Safety Considerations

VulPro initiated tree nesting vulture surveys throughout southern Africa in 2013. Through the years we have refined our process to achieve the highest level of accuracy and productivity whilst out in the field. It is of utmost importance that step by step protocols are followed to make sure results are comparable between observers and sites so that trends can be monitored and analyzed yearly. What follows is the protocol refined by VulPro over the years of undertaking vulture tree nesting surveys. VulPro still follows this practise to date.

This protocol uses walking surveys. Walking surveys are preferred as aerial surveys (including drones) can cause serious disturbance to breeding vultures and their nestlings if not done correctly and sensitively. From our experience, walking surveys are preferable when compared to road transects where the survey can bias the study towards areas with roads only. Furthermore non-walking surveys, for example from a vehicle or a drone, make it very difficult to view hidden nests within the tree canopy and tree forks (hooded vulture nests, for example). Therefore, walking surveys are recommended as they maximize the accuracy of each site's survey results, but this is of course only possible in reasonably sized land.

All surveys should be done with a minimum of two individuals and never alone for the safety of field workers. Surveys can be dangerous with regards to other wildlife and the remoteness of certain field sites. It is thus important to always have at least one extra person in the field in case of emergencies. In game reserves, we recommend having a tracker and/or guard accompany field workers in 'Big 5' territory. The terrain and climate at these field sites can be extreme; one should enter the field prepared with the correct equipment and mindset.

### Equipment needed

- Handheld GPS device specific to the site
- Spare batteries for the handheld GPS device
- Good binoculars
- Camera
- Clipboard, data sheets and pens
- Bags for collecting egg shell fragments or carcass remains
- Cell phone for communication and phone charger or portable phone charger for extended battery life
- Backpack for carrying equipment
- Water and backup water as field sites are located in areas where temperatures regularly reach 40 degree Celsius
- Snacks and food to eat on the go, including fruit, energy bars, and a source of protein (biltong, nuts, etc.) for sustained energy
- Comfortable walking clothes and shoes
- Hat and sun cream

## Methodology

Vulture breeding sites are found by engaging with landowners where vultures roost, feed or have been seen breeding. Once you are aware of one or several nests in the area, assess the land before going out into the field to create a survey route that will allow you to visually cover the entire area. Use a map or virtual map software to assess topography and property ownership boundaries.

Surveys are walked, often along river courses and along the river beds and banks of the river, to document all nests. Not every vulture chooses to breed along rivers and thus, there could be clusters of nests more “in-land” and these regions also need to be explored. Each field site will differ with regards to starting and ending points of walking transects, but one should try to follow the same route each survey and each year to avoid missing nests and duplicating regions or nests in a transect.

Every nest that is found, either through the landowner’s knowledge or through a walking survey, must be logged on a handheld GPS device. As more surveys are conducted, more nests will be discovered at various times of the year and across years. New nests should be recorded and each should be given an individualized identification number.

Record each nest’s GPS location directly underneath the nest along with the variables discussed below. You may find two nests in one tree and this needs to be documented with both nests given their own GPS co-ordinates and an explanation. For example, ‘Nest N02 is located in the same tree, 2 m below nest N03’. Survey date and survey number must also be recorded. From our experience, it is easier to have one device per survey site to avoid potential issues or faults recording nests. As survey sites vary greatly from protected nature reserves and game farms to private lands, hunting farms, piggeries and mining, all survey site variables need to be recorded and taken into consideration when undertaking surveys, including land use and whether the area is protected or non-protected.

Annual tree nesting surveys are conducted three times a year, specifically in 1) May, 2) July/August, and 3) September/October. If three surveys are not possible, we recommend undertaking the first survey slightly later i.e June, followed by the third survey in September/October. If possible, keep survey dates for each field site consistent across years.

The following should be recorded at each nest site:

- 1) tree species;
- 2) height of the tree and height of the nest within the tree;
- 3) accessibility of the nest (is the tree climbable to process the fledgling?);
- 4) vegetation type in the area;
- 5) species of vulture or occupant; and
- 6) activity of nest and/or parents.

The first survey is conducted during the early breeding season and documents the number of breeding pairs. A nest is considered an occupied territory with an active breeding pair only when an adult is found tenanted at the nest, preferably with its mate;

the pair is seen copulating; the pair or individual bird is seen working i.e building and refurbishing its nest or an adult is seen incubating.

Codes for activities are summarized in Table 1. It is also important to note inactive nests, as many nests that have been active in previous years will not be active (see Table 1). These codes and behaviours are the same as those used in our cliff nesting vulture breeding surveys.

**Table 1: Standardised coding for tree nesting vulture activities at nest sites**

<b>Code</b>	<b>Meaning</b>
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.
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: 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	Copulation, 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: building a nest or working on or with its nest.
Z	Ringed, or marked adult at nest.
?	Code or observation uncertain.
-	Inactive nest: nest present but no other activity.

The same survey transect and observation process should be conducted for the second and third surveys. The second survey records the number of nestlings that have survived so far, documenting mid-season breeding success. The third survey records the number of fledglings or larger chicks that have survived, documenting final or annual breeding success.

Nests and nest sites that are not active but which have been previously active, should still be monitored and noted during each survey despite their inactivity. Vultures, either the original pair or a new pair, may occupy the nesting site and refurbish the nest again for breeding. If a tree with a nest has been destroyed for whatever reason, this too needs to be recorded and the surrounding area still needs to be monitored repeatedly in case the birds return to a neighbouring tree. A note should be made if another species is occupying a nest, such as an owl or goose.

An important note for these surveys is to remember that human disturbance will sometimes flush adult birds and fledglings. Therefore, one should anticipate coming

up to the nests and take care to watch from a distance and observe the birds' behaviours. If no breeding activity is noted, one should approach and check the ground under the tree and nest to document the presence of faeces, egg-shell fragments or dead chicks on the ground to confirm failed breeding attempts. Some trees are too tall to confirm breeding. In these cases you can listen for signs of chick activity under the tree during the second and third survey. Surveys should be thorough, but take care to not spend more than 15 minutes in the region of a nesting tree, to avoid causing lasting disturbance to the breeding pair.



*An African white-backed Vulture nest (left) and adult (right) are highlighted during surveys along the Olifants River in Limpopo Province, South Africa.*