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## **BIRD MONITORING PROGRAMME FOR THE OPERATIONAL PHASE**

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### **1. Purpose**

This document serves as a framework for the set-up of the construction and post-construction bird monitoring during the construction and operational phase of the wind energy facility. The attached document, i.e. Birds and Wind Energy: Best-Practice Guidelines, should also be read in conjunction with this framework document and should be considered when setting up bird monitoring.

### **2. Construction Phase Monitoring**

Construction monitoring will be undertaken by taking the attached document, i.e. Birds and Wind Energy: Best-Practice Guidelines, into account. As is noted in the aforementioned document, "a suitably qualified Environmental Control Officer (ECO) could undertake construction-phase monitoring". As construction phase monitoring was not considered necessary for this Wind Farm, as it was not recommended/required by the avifauna specialist in the avifaunal impact assessment nor in the pre-construction bird monitoring, the ECO will be tasked with conducting the relevant monitoring activities as per the best practice guideline.

### **3. Post-Construction Monitoring**

Aims include:

- » To compare the abundance index for all the priority species within the development area after construction against the pre-construction baseline to measure actual displacement due to the construction and operation of the wind farm. Recommended survey method is line transect counts.
- » To estimate the risk of priority species colliding with the wind turbines by recording actual collisions and comparing post-construction flight patterns with pre-construction baseline data. Recommended methods are carcass searches and Vantage Point (VP) watches.

#### **3.1. Methodology for calculating abundance index using line transects**

Ideally, surveys should be conducted in two seasons of years 1, 2, 3, 5, 10 and 15; after the wind farm becomes operational. Bird responses to wind farms may operate over very long periods of time, and that monitoring needs to take this into account, as results from short term observational studies are unlikely to be representative.

### 3.2. Methodology for estimating actual collision rates using carcass searches

Carcass searches are the most direct way of estimating the number of collisions and hence the likely impact on species of conservation importance. Measures of the number of collisions can also help to quantify avoidance rates (as used in collision risk modelling calculations), and, when collisions can be ascribed to a particular time, contribute to an understanding of environmental conditions and behaviours that increase collision risk.

The value of surveying the area for collision victims only holds if some measure of the accuracy of the survey method is developed. To do this, a sample of suitable bird carcasses (of similar size and colour to the priority species – e.g. Egyptian Goose *Alopochen aegyptiacus*, domestic waterfowl and pigeons) should be obtained and distributed randomly around the site without the knowledge of the surveyor, sometime before the site is surveyed. This process should be repeated opportunistically (as and when suitable bird carcasses become available) for the first two months of the monitoring period, with the total number of carcasses not less than 20. The proportion of the carcasses located in surveys will indicate the relative efficiency of the survey method.

Simultaneous to this process, the condition and presence of all the carcasses positioned on the site should be monitored throughout the initial two-month period, to determine the rates at which carcasses are scavenged from the area, or decay to the point that they are no longer obvious to the surveyor. This should provide an indication of scavenge rate that should inform subsequent survey work for collision victims, particularly in terms of the frequency of surveys required to maximise survey efficiency and/or the extent to which estimates of collision frequency should be adjusted to account for scavenge rate. Scavenger numbers and activity in the area may vary seasonally so, ideally, scavenge and decomposition rates should be measured twice during the monitoring year, once in winter and once in summer.

The area within a radius of at least 50 m of each of the turbines (from the outer edge of rotor zone) at the facility should be checked regularly for bird casualties. The frequency of these surveys should be informed by assessments of scavenge and decomposition rates conducted in the initial stages of the monitoring period (see above), but they should be done at least weekly for the first two months of the study. The area around each turbine, or a larger area encompassing the entire facility, should be divided into quadrants, and each should be carefully and methodically searched for any sign of a bird collision incident (carcasses, dismembered body parts, scattered feathers, injured birds). All suspected collision incidents should be comprehensively documented, detailing the precise location (preferably a GPS reading), date and time at which the evidence was found, and the site of the find should be photographed with all the evidence *in situ*. All physical evidence should then be collected, bagged and carefully labelled, and refrigerated or

frozen to await further examination. If any injured birds are recovered, each should be contained in a suitably-sized cardboard box. The local conservation authority should be notified and requested to transport casualties to the nearest reputable veterinary clinic or wild animal/bird rehabilitation centre. In such cases, the immediate area of the recovery should be searched for evidence of impact with the turbine blades, and any such evidence should be fully documented (as above).

#### **4. Landowner Consultation**

Before the carcass search commences and before a carcass search team is appointed, the Landowners/ Farmers must be consulted. The consultation should outline the methods of the carcass searches. Details, e.g. frequency of searches, contact/ responsible persons, access control, etc. must be discussed and agreed with the Landowners/ Farmers. To ensure the safety of Landowners/ Farmers it is also recommended that a background check is done on all employees/ members of the carcass search team before they are appointed and that proof of this is kept. The carcass search team should be introduced to the Landowners/ Farmers. Landowners/ Farmers should at all times be kept informed of the whereabouts of the carcass search team. All relevant EMPr conditions, e.g. no hunting/ killing of animals, no fires on site, no camping on site, etc. will apply to the carcass search team. They must therefore be inducted to the Wind Farm and made aware of all rules, regulations and code of conduct. Landowner Requirements agreed upon will be signed and form part of this Report.

This document can be updated as and when required.

#### **5. References**

Barnes, K.N. 2000. The Eskom Red Data Book of birds of South Africa, Lesotho and Swaziland. BirdLife South Africa, Randburg, 2000.

De Lucas, M., Janss G.F.E and Ferrer M. A bird and small mammal BACI and IG design studies in a wind farm in Malpica (Spain). 2005. *Biodiversity and Conservation* 14:3289-3303

Harrison, J.A., Allan, D.G., Underhill, L.G., Herremans, M., Tree, A.J., Parker, V & Brown, C.J. (eds). 1997. *The atlas of southern African birds*. Vol. 1&2. BirdLife South Africa: Johannesburg.

Jenkins, A.R., Van Rooyen, C., Smallie, J., Anderson, M.D., & Smit, H. 2011. BirdLife South Africa/Endangered Wildlife Trust Best Practice Guidelines for Avian Monitoring and Impact Mitigation at proposed wind energy development sites in southern Africa.

Retief, E.F, Diamond, M., Anderson, M.D., Smit, Dr. H.A., Jenkins Dr. A. & Brooks, M. 2011. *Avian Wind Farm Sensitivity Map for South Africa: Criteria and Procedures Used*.

StatSoft, Inc. STATISTICA (data analysis software system), Version 10. 2011

[www.Statsoft.com](http://www.Statsoft.com).

Taylor, P.B., Navarro, R.A., Wren-Sargent, M., Harrison, J.A. & Kieswetter, S.L. 1999. *Coordinated waterbird Counts in South Africa, 1992-1997*. Avian Demography Unit, Cape Town.

Young, D.J., Harrison, J.A., Navarro, R.A., Anderson, M.D. and Colahan, B.D. (eds). 2003. *Big Birds on Farms: Mazda CAR Report 1993-2001*. Avian Demographic Unit. University of Cape Town, South Africa.