

AVIFAUNA MONITORING PROGRAMME

1. INTRODUCTION

Condition 32 of the Environmental Authorisation (EA) issued for the Struisbult PV2 Facility required that “A 12 month pre- and post-construction avifauna monitoring programme must be implemented to document the effect of the operation of the PV solar facility on avifauna. The monitoring programme must be in terms of the methodology as recommended on pages 19-20 of the Avifauna Impact Assessment Report which forms part of the EIA dated April 2012.”

The monitoring programme below has been extracted from the Avifauna Impact Assessment Report compiled by Avisense Consulting as per the requirement of the EA and should be the basis of the pre- and post-construction avifaunal monitoring.

2. LONG-TERM MONITORING

Given that solar energy development is new to South Africa, and its potential impacts on birds are generally not well understood, it is recommended (but not prescribed) that attention be given to improving this understanding by initiating quantitative studies of the avifauna at proposed sites both pre- and post-construction. The primary aims of this monitoring work would be to:

- (i) Determine the densities of birds resident within the impact area of the solar power plant before construction of the plant, and afterwards, once the plant, or phases of the plant, become operational.
- (ii) Document patterns of bird activity and movements in the vicinity of the proposed solar power plant before construction, and afterwards, once the plant is operational.
- (iii) Register and as far as possible document the circumstances surrounding all avian mortalities associated with the solar power plant and its ancillary infrastructure for at least six months after the plant becomes operational.
- (iv) Register and as far as possible document the circumstances surrounding all other avian interactions with the solar arrays of the solar power plant for at least six months after the plant becomes operational.

Bird density and activity monitoring should focus on rare and/or endemic, potentially disturbance or collision prone species, which occur with some regularity in the area. Ultimately, the study should provide much needed quantitative information on the effects of the solar power plant on the distribution and abundance of birds, and the actual risk it poses to the local avifauna and serve to inform and improve mitigation measures to reduce this risk. It will also establish a precedent and a template for research and monitoring of avian impacts at possible, future solar power plant sites in the region. Failing the institution of a structured and formalised general monitoring effort (as outlined above and detailed below), at the very least a specialist ornithologist should periodically monitor activities at both of the key raptor nests, immediately preceding, during and after construction.

Monitoring protocols: Avian densities before and after

A set of at least 10 walk-transect routes, each of at least 250 m in length, should be established in

areas representative of all the avian habitats present within a 2 km radius of centre of the Struisbult PV site. Each of these should be walked at least once every two months over the six months preceding construction, and at least once every two months over the same calendar period, at least six months after the PV plant is commissioned. The transects should be walked after 06h00 and before 09h00, and the species, number and perpendicular distance from the transect line of all birds seen should be recorded for subsequent analysis and comparison.

Monitoring protocols: Bird activity monitoring

Monitoring of bird activity in the vicinity of the solar power plant should be done over a single day at least every two months for the six months preceding construction, and at least once per quarter for a full calendar year starting at least six months after the solar power plant is commissioned. Each monitoring period should involve full day counts of all species flying over or past the PV plant impact area (see passage rates below).

Monitoring protocols: Bird flight behaviour and activities around solar arrays

Counts of bird traffic over and around the proposed/operational solar power plant should be conducted from suitable vantage points (selected and used to provide coverage of avian flights in relation to all areas of the PV plant). Once in position at the selected count station, the observer should record (preferably on a specially designed data sheet) the date, count number, start-time and conditions at start - extent of cloud cover, temperature, wind velocity and visibility – and proceed with the count. The counts should detail all individuals or flocks of the stipulated priority bird species, all raptors, and any additional species of particular interest or conservation concern, seen flying within 200 m of the envisaged or actual periphery of the solar power plant. Each record should include the following data: time, updated weather assessment, species, number, mode of flight (flapping, gliding, soaring), flight activity (commuting, hunting other), direction of flight and, for post construction monitoring, notes on any obvious evasive behaviour or flight path changes observed in response to the solar power plant. The time and weather conditions should again be noted at the end of each count. These observations should also detail (time, species, nature, location, duration) all direct interactions between birds and the solar panels (e.g. perching, hunting, displaying, nest-building).

Monitoring of avian collisions

Collision monitoring should have two components: (i) experimental assessment of search efficiency and scavenging rates of bird carcasses on the site, and (ii) regular searches of the vicinity of the solar power plant for collision casualties.

Monitoring of avian collisions: Assessing search efficiency and scavenging rates

The value of surveying the area for collision victims only holds if some measure of the accuracy of the survey method is developed (Morrison 2002). 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, some time 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 10. 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 maximize survey efficiency and/or the extent to which estimates of collision frequency should be adjusted to account for scavenge rate (Osborn et al. 2000, Morrison 2002). 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.

Monitoring of collisions: Collision victim surveys

The area within a radius of at least 20 m of each solar panel, the area on and under the panel itself, and the area within 5 m on either side of any new lengths of power line, should be checked regularly for bird casualties (Anderson et al. 1999, Morrison 2002). 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. All suspected mortality incidents should be comprehensively documented, detailing the apparent cause of death, 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, and the local conservation authority should be notified and requested to transport casualties to the nearest reputable veterinary clinic or wild animal/bird rehabilitation centre. These surveys should also include detailing (location, extent, size, number) of all bird products (e.g. faeces, pellets, nest structures etc) found on the solar panels.