



GOLDEN MOLE SPECIALIST ASSESSMENT

Albany Wind Energy Facility (WEF),
Makhanda/Grahamstown, Eastern Cape Province



OCEAS

ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES



**Albany Wind Energy Farm,
Makana Municipality, Eastern Cape**

GOLDEN MOLE SPECIALIST ASSESSMENT

Prepared for:



EDF Renewables

<https://edf-re.co.za/>

Prepared by:



BIODIVERSITY UNIT

CES - Environmental and Social Advisory Services

www.cesnet.co.za

November 2023

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REVISIONS TRACKING TABLE

CES Report Revision and Tracking Schedule

Document Title:	Golden Mole Specialist Assessment - Albany WEF, Makhanda, Eastern Cape		
Client Name & Address:	EDF Renewables (Pty.) Ltd. Waterfront Business Park, Building 5, Ground Floor, 1204 Humeral Road, Humeral Gqeberha 6001		
Status:	Draft		
Issue Date:			
Lead Author:	Jonathan Balmer	Senior Ecologist	
Reviewer:	Brian Reeves	Principal Ecologist	
Report Distribution	Circulated to	No. of hard copies	No. electronic copies
Report Version	Date		

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Info@cesnet.co.za

www.cesnet.co.za



SPECIALIST TEAM

JONATHAN BALMER, Senior Specialist

Jonathan completed a Master's degree in ornithology and phylogenetics through Rhodes University in Grahamstown, which he obtained with distinction. His M.Sc followed straight on from his B.Sc.(Hons) in Zoology, and B.Sc in entomology and ichthyology from the same institution. Jonathan is an old-school naturalist with a passion for birding, herping and list-keeping, and he has over 10 years of guiding experience around Southern Africa. His other work experience includes contractual EIA surveys (3 years), birding app development (5 years), and junior school sports coaching (3 years). Although his professional focus has usually been ornithological in nature, he is comfortable working with most other animal classes as well and has published research works and photographic material of mammals, fishes, reptiles, amphibians, and arthropods.

BRIAN REEVES Pr.Sci.Nat., Principal Specialist

Brian has more than 20 years of experience in ecology, environmental management, conservation management planning, and decision-support. He was an ecologist at the Eastern Cape Parks & Tourism Agency (ECPTA) for twelve years before joining CES in 2023. During this time, he gained experience in developing and managing ecological research and monitoring programmes, including for threatened species (such as black rhino, leopard, Cape mountain zebra, Hewitt's ghost frog and kloof frog) and for critical ecological processes (such as fire). He also has experience in Integrated Environmental Management, gained in both the public and private sectors, and is familiar with environmental management and assessment tools, environmental legislation, and policy. His experience includes adhering to international environmental and social sustainability safeguards. Brian also has experience in developing and implementing biodiversity stewardship programmes.

PROFESSOR BEN SMIT, Senior Lecturer, Rhodes University Zoology Department

Ben is currently employed as a Senior Lecturer in the Department of Zoology and Entomology, Rhodes University, Grahamstown, South Africa. A majority of his research focuses on behavioural and physiological responses in small endotherms.

Contact Details

Name	Jonathan Balmer
Designation	Senior Specialist
E-mail	jo.balmer@cesnet.co.za

Name	Brian Reeves
Designation	Principal Specialist
E-mail	brian.reeves@cesnet.co.za

www.cesnet.co.za



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1 INTRODUCTION AND PROJECT DESCRIPTION

Albany Wind Power (Pty) Ltd plans to develop, construct and operate a Wind Energy Facility (WEF) and associated grid infrastructure approximately ten (10) kilometres east of Makhanda (Grahamstown) in the Eastern Cape Province. The project site is situated in the Makana Local Municipality, which forms part of the Sarah Baartman District Municipality.

The project description of the Albany WEF, which has been assessed, includes:

- Up to twenty-five (25) turbines with a maximum nominal power output of up to 297MW.
- The proposed WEF will include turbines with a rotor diameter of up to 170 m, a hub height of up to 130 m and blade length of up to 85 m.
- A permanent laydown area next to the locations of the proposed wind turbines (3,900 m² for crane hardstand per turbine).
- Temporary additional laydown area next to the locations of the proposed wind turbines (3,100 m² for crane hardstand and blade laydown per turbine).
- Foundations (up to 900 m²) for each wind turbine.
- Permanent 25 m² area for switchgear and/or transformer at each turbine.
- Temporary infrastructure including a site camp and a laydown area of approximately 2,500 m² (all to be rehabilitated post construction).
- Internal access roads of between 8 m (during operation) and 14 m (during construction, to be partly rehabilitated) wide to each turbine and associated infrastructure.
- Existing roads have been used in the layout design, where possible. However, where required, new internal access roads are being proposed between the turbines.
- Medium voltage cabling between turbines and the switching stations, to be laid underground where technically feasible.
- Two short overhead line(s) of 2 km (near WTG 13) and 0.3 km (from WTG 20) to connect the turbines north of the river.
- Temporary laydown areas of a combined 90,000 m² (9 ha), consisting of:
 - West 1 (2 ha)
 - West 2 (2 ha)
 - Centre (2 ha)
 - East (3 ha)
- A permanent area of up to 100,000 m² for the IPP substation, Battery Energy Storage System (BESS), Operations and Maintenance (O&M) building and a temporary site office.

Coastal and Environmental Services (Pty) Ltd, trading as 'CES', was appointed by EDFR to undertake a faunal ground-truthing survey of the development footprint to identify populations of threatened Species of Conservation Concern (SCC) which could present development constraints or mitigations. One condition of the survey was that a specific Golden Mole presence/absence study be conducted on the site, with input from a specialist.

According to the Species Environmental Assessment Guideline (SANBI, 2020), the term 'SCC' refers to all species that are assessed according to the IUCN Red List Criteria as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Data Deficient (DD) or Near Threatened (NT), as well as range-restricted species which are not declining and are nationally listed as Rare or Extremely Rare (also



referred to in some Red Lists as Critically Rare). These species may be impacted significantly by a proposed development. However, for the purpose of this report, animal species that are protected in terms of the National Environmental Management: Biodiversity Act (NEM:BA) (Act No. 10 of 2004) are also referred to as SCC.

The following report outlines the findings of the faunal ground-truthing investigation undertaken for the Albany WEF and associated infrastructure, with specific relevance to Golden Moles.



2 OBJECTIVES & TERMS OF REFERENCE

The main objective of this study was to determine the status of Golden Moles (Afrosoricida: Chrysochloridae) within the proposed development footprint of the Albany WEF and associated infrastructure. This specialist data was required to inform the placement and/or movement of infrastructure components, and/or any mitigation methods (if required). The terms of reference for this study are outlined below:

- Identify and record trace evidence Golden Moles present within the development footprint.
- Summarise the findings of the ground-truthing investigation in a report.
- Make recommendations regarding the refinement of the development layout, including the placement of turbines and associated infrastructure, if required.
- Provide recommendations and relevant mitigation measures (if required).



3 ASSUMPTIONS AND LIMITATIONS

Assumptions and limitations associated with the faunal ground-truthing are listed below

- Fossorial animals are difficult to find and identify. Whilst every effort was made to locate and identify all species of Golden Mole within the development footprint, it is possible that additional species could be found during site clearance and construction of the development, particularly in areas that they were not active at the time of the site survey.
- Due to restrictions on time and access, the entire development footprint was not surveyed. However, a significant portion of similar habitat within the study site was surveyed which provided sufficient information on status of Golden Moles in the affected area in order to draw conclusions and make recommendations.
- It should be noted that the location (GPS position) of every piece of Golden Mole trace evidence was recorded, and will be made available upon request. However, for the sake of this report, Golden Moles will be said to have been found relative to each turbine cluster.
- Sampling could only be carried between specific dates, due to time constraints. Because Golden Moles are usually more active after rain, and the period prior to and during sampling was dry, the conditions may also have lowered the chances of encountering Golden Moles on the site.
- The information, as presented in this document, only has reference to the study site as indicated on the project maps. Therefore, this information cannot be applied to any other area without a detailed investigation being undertaken.



4 METHODOLOGY

Prior to the site visit, the species of Golden Mole likely to occur within the development footprint was compiled based on those recorded during previous studies undertaken within the project area, the list of sensitive species identified within the Department of Forestry, Fisheries and the Environment (DFFE) Screening Report generated for the site, the IUCN website, as well as records obtained from iNaturalist and other citizen science projects. The likelihood of occurrence of Golden Mole species on site was then assessed based on the current known distribution and specific habitat requirements.

The ground-truthing investigation (site survey) was undertaken over the course of ten days, from 24-27 October 2023, with further focused surveys taking place on 1-2 November 2023, which included the Golden Mole Specialist Study. The entire development footprint was visually surveyed on foot to locate and identify faunal species, or trace evidence thereof, present within the development footprint. Wherever possible, photographs of trace evidence found were taken alongside a scale item for later identification. A GPS position was also recorded.

The site was divided into Western, Central and Eastern clusters for ease of reference, comprising nine, six, and ten turbines respectively.

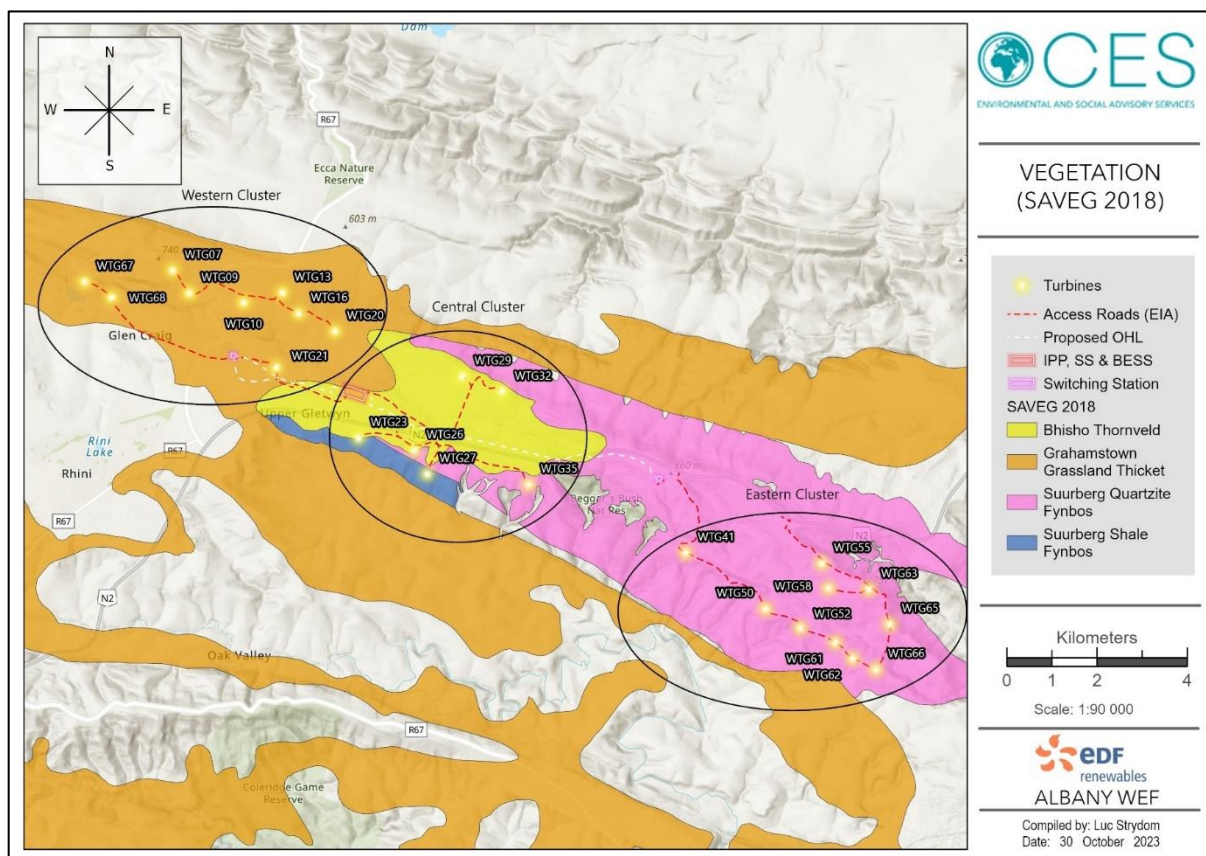


Figure 4.1: Site map depicting the three turbine clusters, with a reference to habitat types.



5 CHRYSOCHLORIDAE: THE GOLDEN MOLES

Golden Moles fall within the Afrotheria clade, and are therefore closely related to elephants, armadillos, sengis and hyraxes. Fossil records suggest their emergence during the early Tertiary period, with molecular evidence indicating a divergence from other Afrotherian orders around 65 million years ago (Springer et al., 2003). They belong to the family Chrysochloridae, a family endemic to sub-Saharan Africa. They are notable for their iridescent fur and unique adaptations to a subterranean lifestyle.

Golden Moles exhibit extreme size variations within the family. While most species range between 10-20 cm in length and weighing between 20-100 grams (Bronner & Jenkins, 2005), the Giant Golden Mole (*Chlorospalax trevelyani*) can measure up to 24 cm in length and weigh around 440 grams (Bronner & Jenkins, 2005), with Grant's Golden Mole (*Eremitalpa granti*) measuring only 7cm, and weighing in at 15-28 grams. All species within the family are adapted for a subterranean lifestyle and share a similar cylindrical body plan, reduced eyes covered in fur, and no external ears. Their forelimbs are powerfully built, with enlarged digging claws which aid in their fossorial existence (Holmes et al., 2007).

Despite their reduced vision, golden moles have heightened tactile and auditory senses. Vibrations and pressure changes in the soil are detected through their sensitive nose and vibrissae, facilitating navigation and prey detection underground (Fielden et al., 1992). It is these attributes in particular that earmark them as a group that could potentially be severely affected by the development and operation of wind turbines.

Golden Moles play a vital role in soil aeration and nutrient mixing due to their burrowing activities. They also contribute to the natural regulation of insect populations, as many species feed primarily on termites and other invertebrates (Nel & Somers, 2013). In the coastal areas of the Eastern Cape, they inhabit sandy soils, which facilitate easier burrowing. These regions often have higher humidity and moisture content, providing an ideal environment for their insect prey (Meester, 2001). Further inland, they can be found in diverse habitats ranging from grasslands to forest margins. These areas offer a different soil composition, often requiring more effort for burrowing activities (Skinner & Chimimba, 2005). There is little evidence of long-distance migration as their movements are localised and primarily influenced by site-specific factors (Bennett & Faulkes, 2000).

Among the 21 recognized species of Golden Moles, several are listed as endangered or vulnerable. In the Eastern Cape, the Hottentot Golden Mole (*Amblysomus hottentotus*) and Sclater's Golden Mole (*Chlorotalpa sclateria*) are listed as Least Concern, while Duthie's Golden Mole (*Chlorotalpa duthieae*) is listed as Vulnerable. The Giant Golden Mole (*Chlorospalax trevelyani*) is currently listed as Endangered due to its limited range and declining population (IUCN Red List, 2021).

The primary threat to Golden Moles is habitat destruction due to urbanization, agriculture, and deforestation. These activities not only reduce available habitat but also fragment populations, leading to genetic bottlenecks and preventing gene flow (Willows-Munro & Robinson, 2012). In addition, altered rainfall patterns and temperature shifts in our current climate impact soil conditions, affecting their prey availability and burrowing habitats (Maree & Bennett, 2014).

Protection efforts include habitat conservation, research on ecological requirements, and public awareness campaigns. In-situ conservation strategies are crucial, given the species' specific habitat needs (Burgess et al., 2010). Efforts to conserve natural habitats in the Eastern Cape, including the establishment of protected areas and wildlife corridors, are crucial for the survival of Golden Moles. Increasing public awareness and education about the ecological role of Golden Moles helps garner support for their conservation (Burgess et al., 2010).



It is not currently understood exactly what the impact of wind turbine activity is on golden moles, but due to their adaptations that allow them to hunt by following vibrations caused by prey movements in or on the soil, it is assumed that turbines do potentially negatively impact the animals (Mason, 2003). Further study is needed before such time that this classifies Golden Moles as SCC regarding wind farms.

Golden Mole conservation faces challenges due to their cryptic nature and the ongoing environmental changes in the region. Continuous research, monitoring, and adaptive conservation strategies are needed to effectively protect the species (Willows-Munro & Robinson, 2012).

5.1 Golden Moles on the site

According to the extensive literature investigated, the site falls well within expected distribution of the Hottentot Golden Mole, and could possibly fall within the understood distribution of the Giant Golden Mole. With the latter being listed as Endangered, desktop studies determined that it would be critical to determine which species any trace evidence belonged to in order to be able to suggest the correct mitigations as a result.

6 GROUND-TRUTHING INVESTIGATION

General faunal ground-truthing took place over four consecutive days (24-27 October 2023), with an additional two days the following week (1-2 November) focusing on golden mole species specifically. During the ground-truthing investigation, no evidence of Golden Moles was encountered until the final day, when evidence of burrowing activity was found in the Eastern cluster between turbines WTG52 and WTG50 (**Figure 6.1**). The burrows seemed unusually large for Hottentot Golden Mole, and while they were documented for later review, it was determined that a specialist needed to be consulted (**Figure 6.2**). This was especially relevant given that the area the tunnels were located was the interface of forest and grassland habitats, the same habitat favoured by the Giant Golden Mole. The forest in question here was an alien Black Wattle (*Acacia mearnsii*) forest. For more details, refer to the separate Botanical Micro-Siting Report.



The track taken during the course of the surveys can be seen in **Figure 6-1** below.

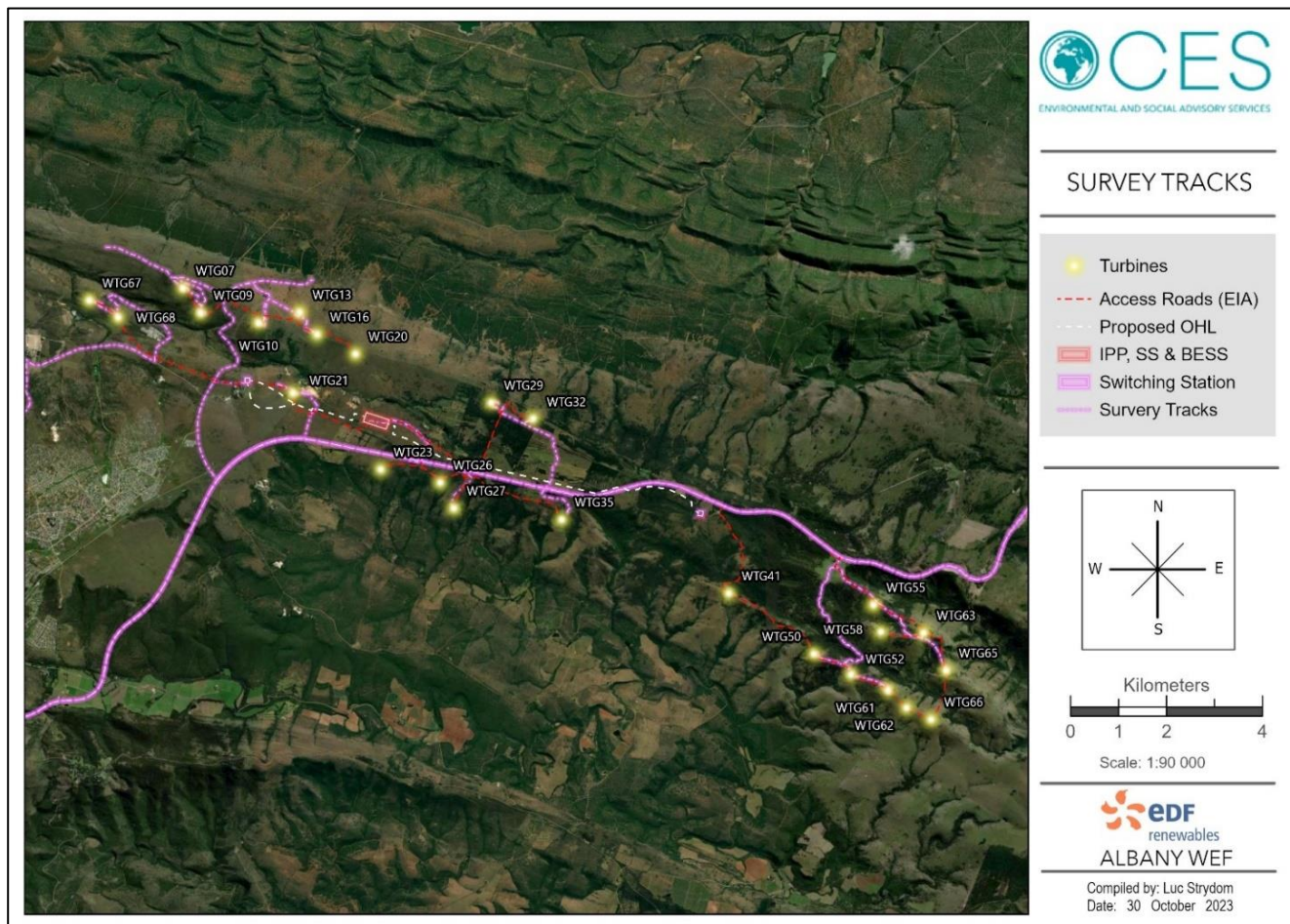


Figure 6-1: Site map showing the survey track relative to the proposed developments on site.

Upon returning to the site, two days were spent documenting the location of tunnels, and attempting to locate an animal for identification. Pitfall traps were also set in close proximity to the tunnel systems and left overnight, in the hopes that a Golden Mole moving on the surface may be caught. At the end of the final day of surveys, it was decided to dig up a section of foraging tunnel in order to get to the more permanent tunnels below the upper layer of soil (**Figure 6.3**). The internal walls of these more permanent tunnels were measured at 60-70mm wide, which would be too small to be able to house a Giant Golden Mole, and it was concluded that the tunnels must therefore belong to Hottentot Golden Moles.



Figure 6-2: Golden Mole surface tunnels found on site.



Figure 6-3: Indication of the width of the external walls of the tunnels.



Figure 6-4: A more permanent tunnel deeper down, with internal measurements of around 65mm.



7 IMPACT STATEMENT, CONCLUSIONS AND RECOMMENDATIONS

The current study indicates that while golden moles appear to occur on site, the species present is likely Hottentot golden mole, which is widely distributed and classified as Least Concern. The species was detected within an extensive stand of black wattle. While such habitats may be utilised by Hottentot golden mole, the eradication of invasive alien plants remains a priority and should continue, as detailed in the Botanical Micro-Siting Report.

Having determined that the species present on site was indeed not the Giant Golden Mole, there is no obvious reason to request any mitigations be implemented during construction or to make any changes to the proposed developmental footprint for the sake of any Golden Mole SCC.

7.1 Ecological Statement and Opinion of the Specialists

Overall, the ecological impacts of the proposed development were assessed and considered to be acceptable as far as Golden Mole species on site are concerned. It is important that any Alien Vegetation Management Plan recommended in the Botanical Micro-Siting Report (please refer to separate document) is adhered to during the construction and operational phase of the proposed development to prevent the further spread of alien invasive species. This in turn would improve the overall health of the system, and allow any displaced faunal species to recolonise areas that were uninhabitable around the time that this survey took place.



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