TERRESTRIAL ANIMAL SPECIES SPECIALIST ASSESSMENT:

RIVERINE RABBIT *BUNOLAGUS MONTICULARIS* WITHIN THE MURA SOLAR EGI CORRIDOR

PRODUCED FOR RED CAP ENERGY

3Foxes Biodiversity Solutions

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First Draft – December 2022

NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) AND ENVIRONMENTAL IMPACT REGULATIONS, 2014 (AS AMENDED) – REPORTING REQUIREMENTS FOR SPECIALIST THEMES

GN 1150 of 30 October 2020: Terrestrial Animal Species Specialist Assessment Report (Very High or High Sensitivity)	Section of Report
3.1.1 contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the assessment including a curriculum vitae;	V
3.1.2 a signed statement of independence by the specialist;	VI
3.1.3 a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	Section 2
3.1.4 a description of the methodology used to undertake the site sensitivity verification, impact assessment and site inspection, including equipment and modelling used where relevant;	Section 2
3.1.5 a description of the mean density of observations/number of sample sites per unit area and the site inspection observations;	Section 2
3.1.6 a description of the assumptions made and any uncertainties or gaps in knowledge or data;	Section 2
3.1.7 details of all SCC found or suspected to occur on site, ensuring sensitive species are appropriately reported;	Section 2
3.1.8 the online database name, hyperlink and record accession numbers for disseminated evidence of SCC found within the study area;	Section 3.3
3.1.9 the location of areas not suitable for development and to be avoided during construction where relevant;	Section 3
3.1.10 a discussion on the cumulative impacts;	Section 3, Section 5
3.1.11 impact management actions and impact management outcomes proposed	Section 3, Section 5
3.1.12 a reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not of the development and if the development should receive approval or not, related to the specific theme being considered, and any conditions to which the opinion is subjected if relevant; and	Section 6
3.1.13 a motivation must be provided if there were any development footprints identified as per paragraph 2.2.12 above [of GN 1150 of 30 October 2020] that were identified as having “low” or “medium” terrestrial animal species sensitivity and were not considered appropriate.	Section 2.4

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SHORT CV/SUMMARY OF EXPERTISE – SIMON TODD

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Ecological Solutions for People & the Environment

Simon Todd is Director and principal scientist at 3Foxes Biodiversity Solutions and has over 20 years of experience in biodiversity measurement, management and assessment. He has provided specialist ecological input on more than 200 different developments distributed widely across the country, but with a focus on the three Cape provinces. This includes input on the Wind and Solar SEA (REDZ) as well as the Eskom Grid Infrastructure (EGI) SEA and Karoo Shale Gas SEA. He is on the National Vegetation Map Committee as representative of the Nama and Succulent Karoo Biomes. Simon Todd is a recognised ecological expert and is a past chairman and current deputy chair of the Arid-Zone Ecology Forum. He is registered with the South African Council for Natural Scientific Professions (No. 400425/11).

Skills & Primary Competencies

- Research & description of ecological patterns & processes in Nama Karoo, Succulent Karoo, Thicket, Arid Grassland, Fynbos and Savannah Ecosystems.
- Ecological Impacts of land use on biodiversity
- Vegetation surveys & degradation assessment & mapping
- Long-term vegetation monitoring
- Faunal surveys & assessment.
- GIS & remote sensing

Tertiary Education:

- 1992-1994 – BSc (Botany & Zoology), University of Cape Town
- 1995 – BSc Hons, Cum Laude (Zoology) University of Natal
- 1996-1997- MSc, Cum Laude (Conservation Biology) University of Cape Town

Employment History

- 2009 – Present – Sole Proprietor of Simon Todd Consulting, providing specialist ecological services for development and research.
- 2007 Present – Senior Scientist (Associate) – Plant Conservation Unit, Department of Botany, University of Cape Town.

- 2004-2007 – Senior Scientist (Contract) – Plant Conservation Unit, Department of Botany, University of Cape Town
- 2000-2004 – Specialist Scientist (Contract) - South African National Biodiversity Institute
- 1997 – 1999 – Research Scientist (Contract) – South African National Biodiversity Institute

A selection of recent work is as follows:

Strategic Environmental Assessments

Co-Author. Chapter 7 - Biodiversity & Ecosystems - Shale Gas SEA. CSIR 2016.

Co-Author. Chapter 1 Scenarios and Activities – Shale Gas SEA. CSIR 2016.

Co-Author – Ecological Chapter – Wind and Solar SEA. CSIR 2014.

Co-Author – Ecological Chapter – Eskom Grid Infrastructure SEA. CSIR 2015.

Contributor – Ecological & Conservation components to SKA SEA. CSIR 2017.

Recent Specialist Ecological Studies in the Vicinity of the Current Site

- Nuweveld North, East and West WEFs. Fauna & Flora Specialist Study for EIA. Zutari 2021.
- Beaufort West PV Facility. Fauna & Flora Assessment. SiVest Environmental 2022.
- San Solar PV Facility, Kathu. Fauna & Flora Assessment. Savannah Environmental 2022.
- Soventix Phase 3 PV Facility, De Aar. Fauna & Flora Assessment. Ecologes Environmental Consultants, 2022.
- Sadawa PV Facilities, Tankwa Karoo. Fauna & Flora Assessment. Savannah Environmental 2021.
- Kotulo Tsatsi PV 1 Facility near Kenhardt. Fauna & Flora Assessment. Savannah Environmental 2021.
- Hyperion 2 PV Facility, Kathu. Fauna & Flora Assessment. Savannah Environmental 2021.

SPECIALIST DECLARATION

I, ..Simon Todd....., as the appointed independent specialist, in terms of the 2014 EIA Regulations, hereby declare that I:

- I act as the independent specialist in this application;
- I perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I have no vested interest in the proposed activity proceeding;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- I have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- all the particulars furnished by me in this specialist input/study are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the specialist: 

Name of Specialist: ____Simon Todd_____

Date: ____10 December 2022_____

1 INTRODUCTION

Red Cap Energy (Pty) Ltd is proposing to develop four solar facilities and an associated grid connection, on behalf of four separate Project Applicants, collectively known as the Mura PV Development between Loxton and Beaufort West in the Beaufort West Local Municipality and Ubuntu Local Municipality and the Central Karoo District Municipality and Pixley ka Sema District Municipality. Each solar facility will connect to the Eskom grid via new 132 kV overhead lines (assessed in a separate process to the PV facilities) connecting the two on-site solar substations via adjacent Eskom switching stations to the approved Nuweveld Collector substation. An Electrical Grid Infrastructure (EGI) Corridor is proposed and includes multiple connection routes of up to two 132 kV overhead lines running in parallel and switching stations to enable the connection of the Mura Solar Developments to the approved Nuweveld Collector Substation.

3Foxes Biodiversity Solutions has been appointed by Red Cap Energy to undertake a terrestrial biodiversity assessment of the proposed project in terms of the Environmental Impact Assessment Regulations, 2014, as amended, including the Gazetted specialist protocols (GN R 320 and GN R 1150 of 2020). The DFFE Screening Tool indicates that the Mura Grid Corridor contains areas mapped as Medium Sensitivity for the Riverine Rabbit, *Bunolagus monticularis,* and the site verification has confirmed the presence of Riverine Rabbit habitat within the corridor as well as areas of known confirmed occurrence. Consequently, in terms of the regulations, a Terrestrial Animal Species Assessment is required for the Riverine Rabbit within the Mura EGI Corridor. To these ends, this Riverine Rabbit Species Assessment for the Mura EGI Corridor, addresses the potential impacts of the Mura Grid Connection and associated infrastructure on the Riverine Rabbit and must be included in the BA for the development and any mitigation and monitoring measures as identified, must be incorporated into the EMPr for the development.

1.1 SCOPE OF STUDY

In terms of GN 320 (20 March 2020) and GN 1150 (30 October 2020) of the NEMA EIA Regulations of 2014 (as amended), prior to the commencement of a specialist assessment, a site sensitivity verification must be undertaken to confirm the current land use and environmental sensitivity of the proposed project areas as identified by the Screening Tool. The results of the Site Verification are provided in another report, but of relevance to the current study is that the DFFE Screening Tool identified the Corridor as having a Medium Sensitivity for the Riverine Rabbit *Bunolagus monitcularis* (CR). The site verification confirms the likely presence of the Riverine Rabbit in the Corridor and hence also the presence of medium sensitivity habitat within of portions of the Corridor for this species. In terms of the Regulations, a Terrestrial Animal Species Impact Assessment is required when required the likely presence of a Species of Conservation Concern (SCC is confirmed within a Medium sensitivity site. In terms of the

guidelines and minimum requirements, the Terrestrial Animal Species Impact Assessment should meet the following terms of reference:

2.1 The assessment must be undertaken by a suitably qualified taxon relevant SACNASP registered specialist aligned with the taxa identified in the report generated from the national web based environmental screening tool on the site being submitted as the preferred development site.

2.2 The Terrestrial Animal Species Impact Assessment must include the results of a site assessment undertaken on the preferred development site.

2.3 The Terrestrial Animal Species Impact Assessment must be undertaken in accordance with the Species Environmental Assessment Best Practice Guidelines and must identify the following:

2.3.1 The species of conservation concern which were found on site;

2.3.2 The distribution, location, viability (ability to survive and reproduce in future) and detailed description of population size of the species of conservation concern identified on the preferred development site;

2.3.3 The nature and the extent of the potential impact of the proposed development on the species of conservation concern on the proposed development site;

2.3.4 The importance of the conservation of the population of the species of special concern identified on the proposed development site based on information available in national and international databases including the IUCN Red List of Threatened Species, South African Red List of Species, and/or other relevant databases;

2.3.5 The potential impact of the proposed development on the habitat of the species of conservation concern;

2.3.6 Any dynamic ecological processes occurring within the site and its surrounds that might be disrupted by the proposed development and resulting impact on the identified species of conservation concern; for example, fires in fire-prone systems;

2.3.7 Any potential impact of ecological connectivity (on site, and in relation to the broader landscape) and resulting impact on the identified species of conservation concern;

2.3.8 Buffer distances as per the Species Environmental Assessment Best Practice Guidelines used for the population of each species of conservation concern;

2.3.9 The likelihood of other threatened species, undescribed species or highly localised endemics, migratory species, or species of conservation concern, occurring in the vicinity; and

2.3.10 Identify any alternative development footprints within the preferred development site which would be of "low" sensitivity as identified by the national web based environmental screening tool and verified through the initial site sensitivity verification.

3. **The findings of the Terrestrial Animal Species Impact Assessment must be written up in a Terrestrial Animal Species Impact Assessment Report.**

This report must include as a minimum the following information:

3.1. Contact details and curriculum vitae of the specialist including SACNASP registration number and fields of expertise;

3.2. A signed statement of independence by the specialist;

3.3. Duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;

3.4. A description of the methodology used to undertake the impact assessment and site inspection, including equipment and modelling used where relevant;

3.5. A description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations;

3.6. Areas not suitable for development, to be avoided during construction and operation where relevant;

3.7. Additional environmental impacts expected from the proposed development based on those already evident on the site and a discussion on the cumulative impacts; and

3.8. Impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);

3.9. A reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not of the proposed development and if the proposed development should receive approval or not, and any conditions to which the opinion is subjected;

3.10. A motivation must be provided if there were development footprints identified as per paragraph 2.3.10 above that were identified as having a "low" terrestrial animal species sensitivity and were not considered appropriate.

4. The findings of the Terrestrial Animal Impact Assessment must be incorporated into the Basic Assessment Report (BAR) or the Environmental Impact Assessment Report (EIAR), including the mitigation and monitoring measures as identified, which must be incorporated into the EMPr. A signed copy of the assessment must be appended to the BAR or EIAR.

These Terms of Reference and reporting requirements are achieved in this study and report.

1.2 RELEVANT ASPECTS OF THE DEVELOPMENT

The infrastructure included on the grid connection application includes the following:

- Eight Eskom Switching stations:
    - Located adjacent to the solar farm substations within the solar area footprint;
    - Maximum height of 12m;
    - Footprint of up to 150 m x 75 m.
    - Four additional up to 150 m x 75 m switching stations located within the corridor;
- ~70 km of overhead 132 kV lines (~40 km will be single overhead 132 kV lines and ~30 km will be up to two overhead 132 kV lines running in parallel running between the switching stations supported by monopole pylons with a max height 38m); and
- Access tracks.

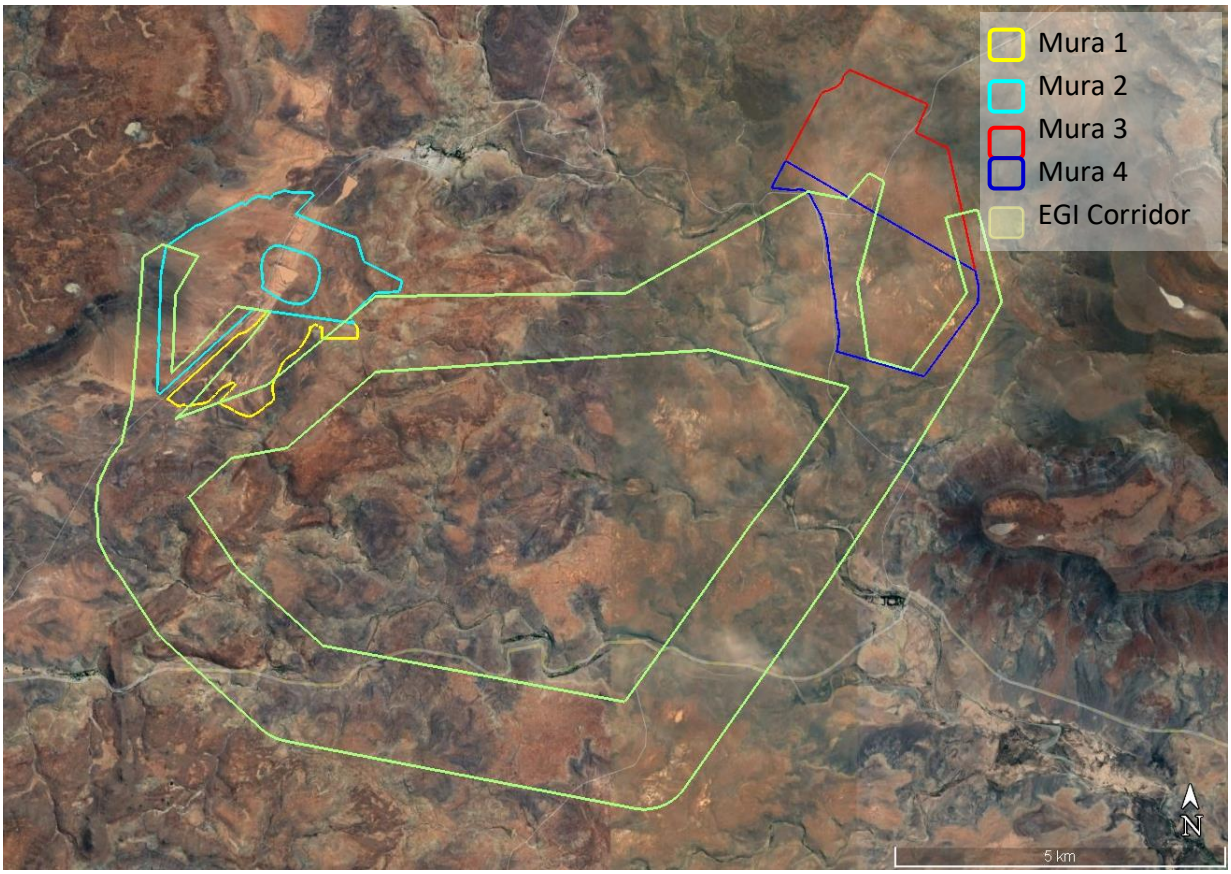

Figure 1. Image showing the regional context and location of the proposed Mura EGI Corridor which links the various Mura PV projects to the Nuweveld Collector Substation.

Table 1. Summary of the components and approximate areas of impact within the Mura Grid Connection Corridor and associated infrastructure.

Project Components	Description	Disturbance footprint
Switching stations	There will be up to two Eskom switching stations on each solar farm with a footprint of approximately 150 x 75 m (11,250 m^2). The switching station area will include all the standard switching station electrical equipment/components, such as bus bars, metering equipment, switchgear, and will also house control, operational, workshop and storage buildings/areas. Additional switching stations are also proposed outside of the solar farm footprint.	13
Overhead lines and pylons	~70 km of overhead 132 kV lines (~40 km will be single overhead 132 kV lines and ~30 km will be up to two overhead 132 kV lines running in parallel running between the switching stations supported by monopole pylons with a max height 38m. The spans (distance between pylons) on the monopole pylons (without stays) are on average 260 m.	2,5

Access roads and tracks	Existing access roads and tracks (upgraded to ± 2-4 m wide where needed) will be used as far as possible and new access tracks would be created where needed (±2-4 m wide). These are required for all project phases.	32
Temporary areas	Temporary laydown areas will be identified along the alignment, with the main equipment and construction yards being located along the alignment or based in one of the surrounding towns or at the solar site camp. It is anticipated that the total area required for the temporary laydown areas is up to 2 ha and two will be required.	4
Total disturbance footprint:	**Temporary**	4
Total disturbance footprint:	**Permanent**	48
	TOTAL	52

2 METHODOLOGY

2.1 HABITAT DELINEATION

In order to assess the availability, distribution and extent of potential Riverine Rabbit habitat within the Mura EGI Corridor, satellite imagery was used to delineate and map areas of potential habitat. Such areas can be reasonably easily delineated from satellite imagery due to the specific habitat requirements of the Riverine Rabbit. According to the IUCN 2016 Mammal Red List Assessment "*The Riverine Rabbit inhabits dense riparian growth along the seasonal rivers in the central Karoo (Nama-Karoo shrubland). Specifically, it occurs in riverine vegetation on alluvial soils adjacent to seasonal rivers*." Such areas are readily visible on satellite imagery and can be mapped with a relatively high degree of accuracy and reliability. Within the study area, areas of habitat are restricted to the major drainage lines of the study site and in particular the Krom Rivier. Apart from areas deemed to be potentially suitable Riverine Rabbit habitat all major and minor drainage features of the site were mapped and included into the overall sensitivity mapping of the corridor.

In addition to the mapping, six camera traps were placed in the field distributed across the PV project areas in order to characterise the fauna community of the PV areas and confirm the absence of the Riverine Rabbit and other fauna of concern from these areas. No Riverine Rabbits or other fauna of concern were detected at the trapping sites.

2.2 LIMITATIONS & ASSUMPTIONS

A number of limitations and assumptions are inherent in the study including the following:

- The presence of the Riverine Rabbit within the areas of suitable habitat present within the corridor was not directly confirmed for the current study. However, data obtained from EWT indicate that all the larger tracts of habitat within the corridor and especially along

the Krom Rivier have historical sightings of Rabbits. In addition, in order to ensure a conservative approach, all areas with suitable habitat are assumed to have Riverine Rabbits present.

- It is assumed that there are no Riverine Rabbits resident in areas outside of the riparian habitat typically associated with this species in the Upper Karoo. This is considered to be a reasonable assumption as this species is known to be strongly associated with riparian vegetation within the study area. It is only in the southern population that Riverine Rabbits can normally be found outside of riparian areas. Furthermore, the camera trapping conducted within the PV areas did not find any Riverine Rabbits present within the open plains habitat, adding support to the above assertion.

2.3 DFFE SITE VERIFICATION

Government Notice No. 320, dated 20 March 2020, includes the requirement that an Initial Site Sensitivity Verification Report must be produced for a development footprint. The outcomes of the Site Verification Report determine the level of assessment required for the site (including that a Riverine Rabbit species assessment be undertaken). The Site Sensitivity Verification Report for Terrestrial Ecology is included as an Annex to the Terrestrial Biodiversity Theme Assessment for the project and is not repeated here. However, of relevance to the current study is that the Site Verification confirms the Medium Sensitivity of the site for the Riverine Rabbit and hence the requirement for the current study.

3 RIVERINE RABBIT ASSESSMENT

3.1 RIVERINE RABBIT SPECIES ACCOUNT

The Riverine Rabbit is endemic to the semi-arid central Karoo region of South Africa and the range within the country is illustrated below in Figure 2. It is associated with dense riparian scrub fringing the seasonal rivers of the region (Figure 3). This habitat specificity is assumed to be related to a dependence on soft and deep alluvial soils along the river courses for constructing stable breeding stops. Home range has been estimated as approximately 12 ha (Duthie 1989). Riverine Rabbits are nocturnal, spending daylight hours in a scrape beneath riparian vegetation. They are solitary, and will only be found in breeding pairs for short periods, or in female-juvenile pairs for rearing purposes (Duthie 1989).

Geographically, Riverine Rabbits occur in two separate populations, with a population centred on the Upper Karoo (the northern population) and a second more-recently discovered population in the Little Karoo (the southern population). Population estimates vary widely and it is clear that a reliable estimate of the overall population size has yet to be made. Duthie et al. (1989) speculated

that the remaining habitat might potentially support around 1,435 individuals. This is in contrast to Collins & Du Toit (2016) who estimated an adult population of between 157 and 207 individuals. This latter estimate was however based on an extrapolation from actual observations of rabbits obtained during monitoring transects, which is not a reliable manner of obtaining density estimates as Rabbits are not easily flushed from their scrapes. In addition, there have been some recent range extensions based on observations of Riverine Rabbits from novel areas including from near to the Baviaanskloof in the Eastern Cape (EWT pers. comm.). The 2016 red list assessment indicates that at the time, there were an estimated 12 subpopulations, three in the southern population and nine in the northern population.

Threats to this species include ongoing habitat degradation and fragmentation due to detrimental land-use practices (largely overgrazing and transformation for intensive agriculture), climate change and renewable energy development. It is estimated that 40–60% of the riparian habitat has been lost as a result of cultivation over the past century.

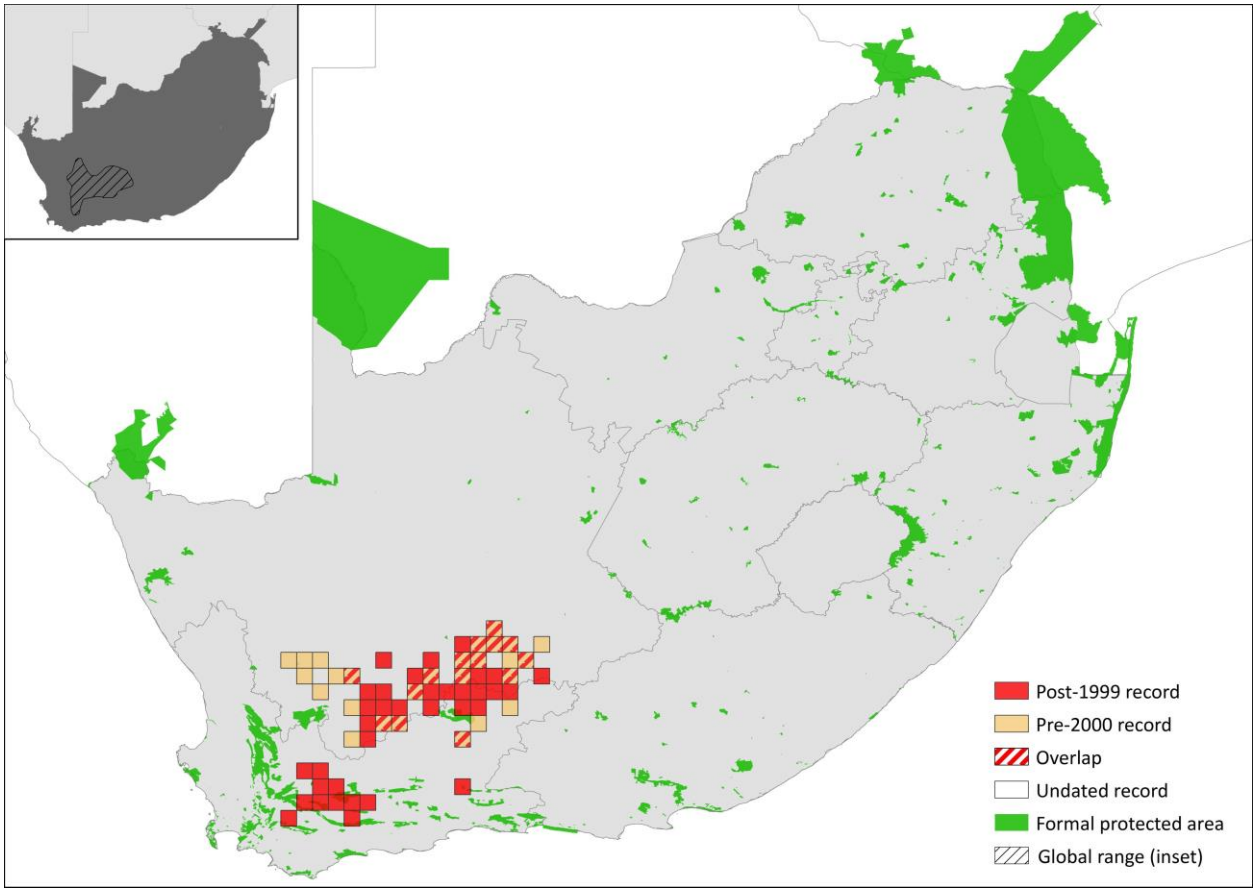

Figure 2. Distribution range for the Riverine Rabbit according to the 2016 IUCN Red-List Assessment conducted by EWT (Collins *et at*. 2016).

Figure 3. Example of riparian vegetation present along the Krom Rivier within the Mura EGI Gridline Corridor, with good vegetation cover and plant species indicative of favourable habitat for Riverine Rabbits.

3.2 HABITAT SUITABILITY ASSESSMENT

Based on mapping from satellite imagery and ground truthing of habitat patches in the field, the areas identified as potential Riverine Rabbit habitat are illustrated below in Figure 4. The areas of habitat have been split into areas considered to represent high quality (optimal) Riverine Rabbit habitat, areas considered to be degraded or otherwise less likely to maintain resident populations of Rabbits and minor drainage features which do not represent habitat, but which may be important for connectivity and also support the areas of habitat in terms of water flow regulation etc. It is only the areas of optimal habitat that are considered to have resident Riverine Rabbit populations. The total extent of optimal habitat within the assessment Corridor is estimated at 134 ha, while the areas of suboptimal habitat is estimated at 49 ha. Based on the Riverine Rabbit density reported by Duthie (1989) for an area near Victoria West (0.06–0.17 individual/ha) which can be assumed to be similar to the density within the corridor, the areas of optimal habitat would be able to support between 8 and 23 individuals of Riverine Rabbits assuming that all of the identified habitat was fully occupied. In reality, the quality and condition of the habitat varies to some degree and hence the density of Riverine Rabbits is also likely to vary significantly. However, even at the maximum potential occupancy, it is clear that the areas of habitat within the Mura EGI Corridor site do not represent a particularly important area for the Riverine Rabbit, compared to adjacent areas with more extensive habitat within both the Krom and Sak Rivers.

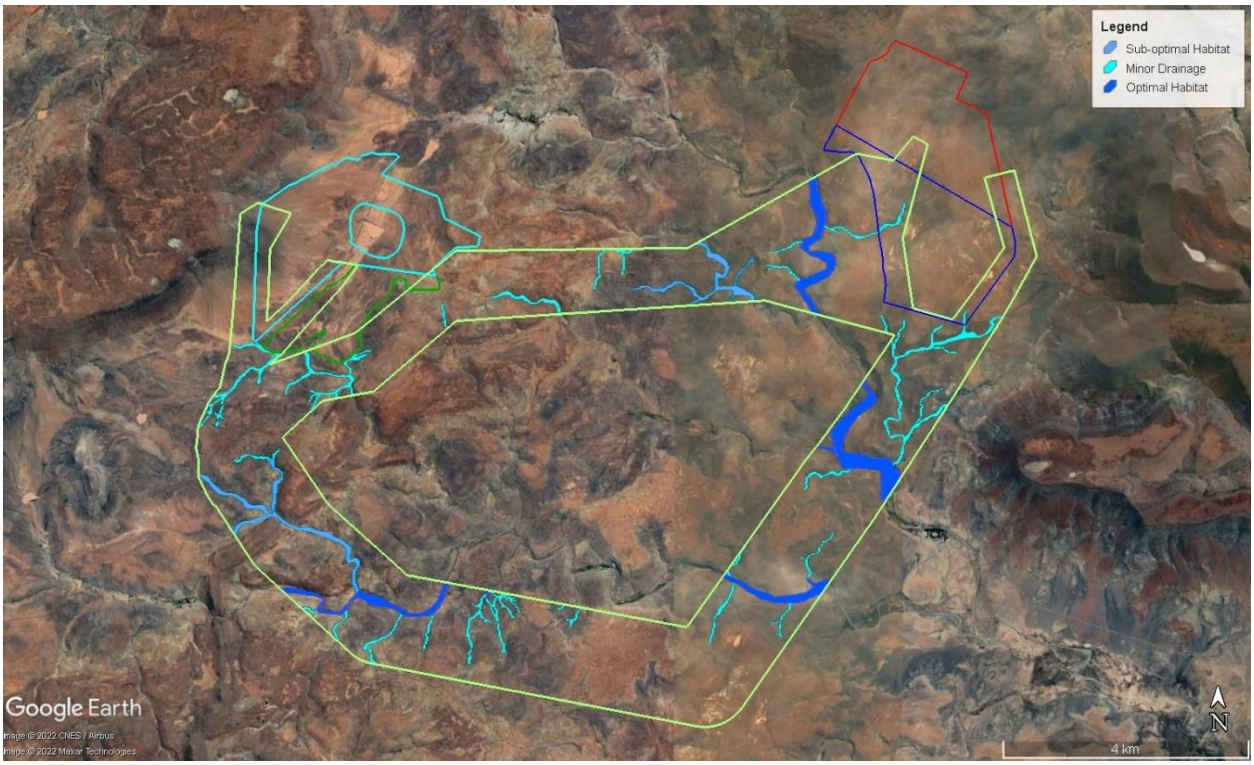

Figure 4. Map of areas considered to represent potentially suitable Riverine Rabbit habitat within the Mura EGI Corridor based on ground-truthed mapping from satellite imagery.

The Area of Occupancy of the Riverine Rabbit has been estimated at 2943 km^2 (Collins et al. 2016) and based on the current assessment, the areas potentially occupied by Riverine Rabbits within the corridor amounts to less than 2 km^2, this represents less than 0.1% of the overall Area of Occupancy of the Riverine Rabbit. The degree of conflict between the Riverine Rabbit and the development of the Mura grid infrastructure is likely to be low as there is no habitat in the areas where the switching stations would be located and the pylons are likely to be able to span the areas of habitat. The Krom Rivier at its widest in the corridor is approximately 300m wide and the pylons would be able to span the whole river and the adjacent floodplains without significant impact on the riparian vegetation that would be home to the Riverine Rabbit. As such, a significant amount of habitat loss related to the project is not likely and habitat loss is not likely to be a significant factor related to the project. There would however be a significant increase in traffic related to both the Mura EGI corridor and the related PV projects, especially during construction, which would potentially have a negative impact through mortality of rabbits related to vehicle collisions.

3.3 SITE ECOLOGICAL IMPORTANCE

The Terrestrial Animal/Plant Species Protocols require specialists to identify:

- the nature and the extent of the potential impact of the proposed development on species of conservation concern occurring on the proposed development site;
- the potential impact of the proposed development on the habitat of the species of conservation concern; and
- any alternative development footprints within the preferred development site which would be of 'low' sensitivity as identified by the screening tool and verified through the site sensitivity verification.

In order to spatially identify the different areas of importance for a species for a proposed development site and to facilitate transparent and comparable reporting of the potential impacts of development, a standardised metric for identifying site-based ecological importance for species, in relation to a proposed project with a specific footprint/ project areas of influence (PAOI) and suite of anticipated activities. It allows for rapid spatial inspection and evaluation of impacts of proposed developments within the context of on-site habitats and Species of Conservation Concern (SCC), and also facilitates integration of inputs from different specialist studies. This process is necessary because the screening tool evaluates 'environmental sensitivity' at a larger scale than that of a proposed development site and frequently includes modelled data that require field verification. This assessment relies on the data collected during the necessary specialist surveys to provide a current evaluation of the on-site habitat conditions. This assessment does not replace the output of the screening tool but is more specific to the proposed development footprint/PAOI and proposed project activities. Where the site-specific assessment produces lower or higher Site Ecological Importance (SEI) classification than the 'environmental sensitivity' output of the screening tool for that particular site, it is the responsibility of the specialist to provide a clear and defensible justification for the difference.

The SEI is considered to be a function of the biodiversity importance (BI) of the receptor (e.g., species of conservation concern, the vegetation/fauna community or habitat type present on the site) and its resilience to impacts (receptor resilience [RR]) as follows:

- SEI = BI + RR

BI in turn is a function of conservation importance (CI) and the functional integrity (FI) of the receptor as follows:

- BI = CI + FI

Given the IUCN status of the Riverine Rabbit (C2a (i)) and its' estimated populations size, the **Conservation Importance** of Riverine Rabbit habitat within the corridor is considered to be **High**. As there is not a large amount of transformation between the areas of confirmed Riverine Rabbit habitat, optimal, the areas of intact habitat are considered to have **High Functional Integrity**. As the CI and FI are both High, the BI of optimal Riverine Rabbit habitat within the corridor is

considered to be High as well. These areas are considered to have a Medium resilience. Thus, the overall **SEI is considered to be High for the optimal, intact, habitat** (Figure 5). In terms of the species assessment guidelines, the implications for the High SEI rating for these portions of the corridor indicates that the following general measures are considered appropriate for areas of Riverine Rabbit Habitat - "*Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted; limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities*."

Areas within the corridor with High SEI for Riverine Rabbit have therefore been mapped as No-Go areas.

3.4 RIVERINE RABBIT SPATIAL ASSESSMENT

The overall extent of habitat loss within the areas identified as being optimal for the Riverine Rabbit can be reduced to zero with careful route alignment and pylon placement outside of the areas of optimal, intact habitat. Furthermore, habitat loss within suboptimal areas can largely be avoided. As such the potential for direct conflict between the power line and the Riverine Rabbit can be reduced to a very low level.

For the gridline, buffers around the areas of habitat were not applied and are not considered necessary as the power line will not generate a continuous impact and while there would be some disturbance at construction, the long-term impact of the power line on the Riverine Rabbit would be minimal during operation. Nevertheless, in order to mitigate potential negative impacts of the power line on the Riverine Rabbit through avoidance and changes to the layout of the development, the following avoidance must be implemented:

- Areas of intact ("optimal") Riverine Rabbit habitat are considered to represent No-Go areas for pylons and new access tracks.
- Access tracks may only traverse areas of optimal Riverine Rabbit habitat along existing mapped, access roads.

As a result of the implementation of the above avoidance mitigation, the overall development footprint of the grid within high-quality Riverine Rabbit will be negligible while impact on sub-optimal habitat will be reduced to a minimal extent and considered to represent a low direct impact of low intensity and low significance.

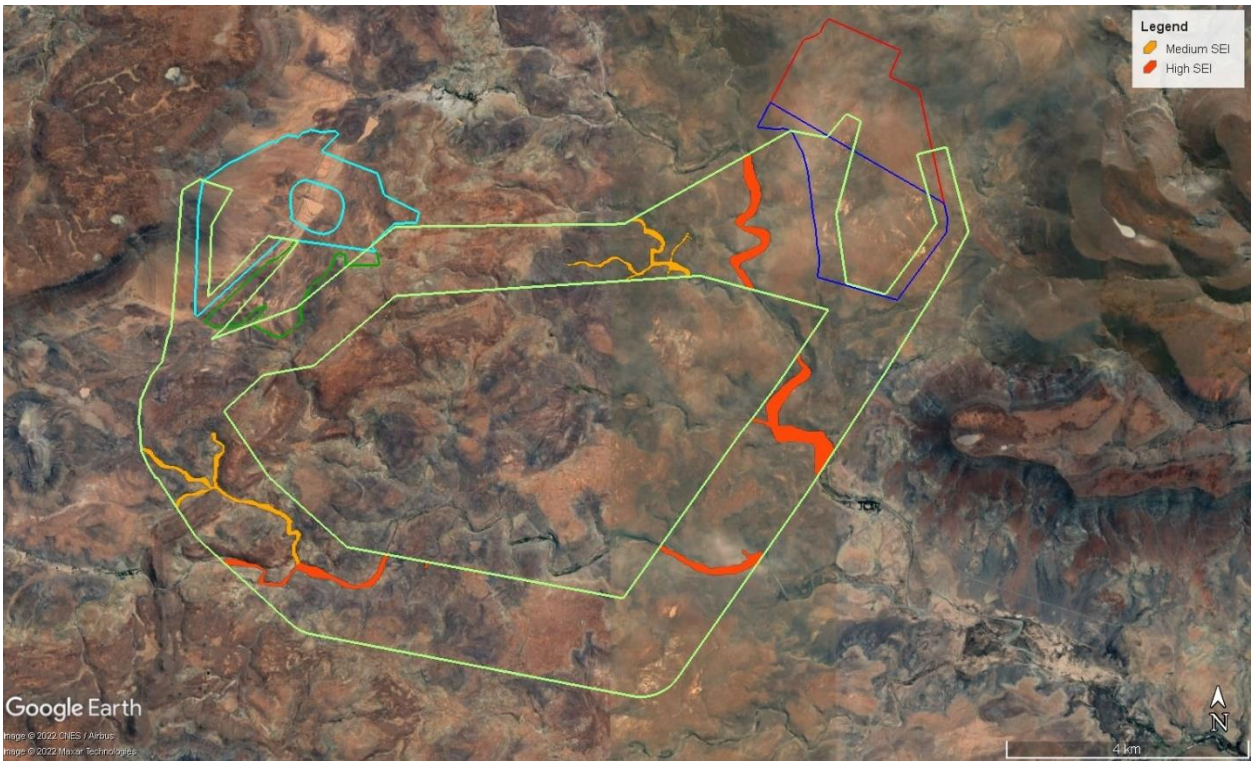

Figure 5. SEI for the Riverine Rabbit within the Mura EGI Corridor.

In terms of broader cumulative impacts on the Riverine Rabbit, the increase in renewable energy development in the Loxton area is a potential concern. The primary avenues of potential impact would likely be from collisions with vehicles due to the increase in traffic in the area; habitat loss and and increase in disturbance due to human activity and turbine noise. Although there are currently no built or preferred bidders in the area, there are numerous planned and approved projects in the area including the adjacent Nuweveld suite of projects as well as the nearby Hoogland North projects. The Riverine Rabbit is considered absent from the Nuweveld site but was confirmed present within the Hoogland project area. The current Mura suite of PV projects would add to the traffic and possibly some habitat loss. There is however no Riverine Rabbit habitat within the Mura PV footprint areas and habitat loss from the Mura EGI Corridor would also be low, with the result that additional traffic impact is likely the only significant manner in which the Mura project would contribute towards cumulative impacts on the Riverine Rabbit. Consequently, the contribution of the Mura PV projects and the associated EGI corridor to cumulative impact on the Riverine Rabbit is relatively low and is considered acceptable.

4 IMPACTS AND ISSUES IDENTIFICATION

4.1 IDENTIFICATION OF POTENTIAL IMPACTS

The development of the Mura EGI Connection may result in a number of potential impacts on the Riverine Rabbit during the construction and operational phases of the development. During construction, the major impact would likely be disturbance, while during the operational phase, direct disturbance would be reduced but there would still be some potential impact from noise and occasional physical disturbance from operational (maintenance) activities. The following impacts are identified as the major impacts that are likely to be associated with the development of the Mura EGI Connection on Riverine Rabbits and their associated habitat.

Impact 1. Construction-Phase Impact on the Riverine Rabbit

During construction, the increased levels of traffic at the site would increase collision risk with rabbits, which is a known major cause of mortality for this species. Furthermore, the noise and disturbance associated with construction activity may deter rabbits from the affected areas where these are in close proximity to areas where Rabbits are present.

Impact 2. Operational-Phase Impact on the Riverine Rabbit

During operation, impacts would be significantly reduced, but occasional anthropogenic disturbance associated with maintenance activities along the power line would potentially impact the Riverine Rabbit while increased traffic within, to and from the site which may increase vehicle-related mortality.

Impact 3. Cumulative impacts on the Riverine Rabbit

The development would contribute towards cumulative impacts on the Riverine Rabbit as a result of habitat loss, disturbance and road-kill related mortality. As areas of optimal Riverine Rabbit would be avoided by the development, the extent of direct habitat loss would be minimal. Disturbance and road-kill related mortality would be concentrated largely within the construction phase of the development with low long-term impacts in the operational phase.

5 ASSESSMENT OF IMPACTS ON RIVERINE RABBIT– MURA GRID CORRIDOR

An assessment of the likely significance of the impacts identified above is made below for the impacts of the Mura Grid Connection and associated infrastructure on Riverine Rabbits.

5.1 CONSTRUCTION PHASE IMPACTS ON RIVERINE RABBITS

Impact Nature: Impacts on the Riverine Rabbit as a result of construction phase activities, including vehicle collisions, disturbance and habitat loss.		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Short-term (2)	Short-term (2)
Magnitude	Low (3)	Low (2)
Reversibility	Recoverable (3)	Recoversible (2)
Probability	Probable (3)	Probable (3)
Significance	Low (30)	Low (24)
Status	Negative	Negative
Irreplaceable loss of resources	No	No
Can impacts be mitigated?	To some degree, but residual impact due to disturbance is unavoidable.	
Mitigation	• Avoid mapped No-Go areas in the placement of pylons and access tracks. • Where any new roads or overhead lines (and associated pylon placement) traverse areas mapped as High Riverine Rabbit habitat sensitivity, the route should be microsited by a suitably qualified ecological specialist before construction commences to ensure any potential impacts are minimised. Existing tracks through these areas should be used where present. • Clearly demarcate riparian areas near to the development footprint as No-Go areas with appropriate signage and barriers. • All vehicles should adhere to a low speed limit on site. Heavy vehicles should be restricted to 30km/h and light vehicles to 40km/h. • During construction, driving between sunset and sunrise should be reduced as far possible as this is when Riverine Rabbits are most active and the risk of collisions is highest. • Should rabbits be killed by traffic, then the traffic management to and from the site should be reviewed in collaboration with the EWT Drylands Programme, to identify additional mitigation and avoidance that should be implemented to further reduce roadkill. • No dogs should be allowed on site and precautions to ensure that there is poaching or other direct faunal disturbance on site should be implemented.	
Residual Risks	Some disturbance within or near areas of suitable habitat cannot be entirely avoided with the result that some residual habitat loss and local disturbance, will occur.	

5.2 IMPACTS ON RIVERINE RABBITS DURING OPERATION

Impact Nature: There would potentially be impact on Riverine Rabbits at the site during operation due to operational activities (vehicle collision and noise disturbance).		
	Without Mitigation	**With Mitigation**
Extent	Local (1)	Local (1)
Duration	Long-term (4)	Long-term (4)
Magnitude	Low (2)	Low (2)
Reversibility	Recoverable (3)	Reversible (1)
Probability	Probable (3)	Low Probability (2)
Significance	Low (30)	Low (16)
Status	Negative	Negative
Irreplaceable loss of resources	No	No
Can impacts be mitigated?	To a large degree, the impacts can be avoided and mitigated.	
Mitigation	• Driving within or to and from the site, should be restricted between sunset and sunrise to essential vehicles and services only. • All vehicles travelling along the power line access road to adhere to a low speed limit of not more than 40km/h. • No additional disturbance to occur within the riparian areas during operation. • Any erosion problems along the power line access road should be remedied at least annually.	
Residual Risks	Some residual disturbance along the power line route is possible due to operation and maintenance activities, but likely to be of a low duration and intensity.	

5.3 DECOMMISSIONING PHASE IMPACTS ON RIVERINE RABBITS

Impact Nature: Impacts on the Riverine Rabbit as a result of decommissioning phase activities, including vehicle collisions, disturbance and habitat loss.		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Short-term (2)	Short-term (2)
Magnitude	Low (2)	Low (2)
Reversibility	Recoverable (3)	Recoverable (3)
Probability	Probable (3)	Low Probability (2)

Significance	Low (27)	Low (18)
Status	Negative	Negative
Irreplaceable loss of resources	No	No
Can impacts be mitigated?	To a large degree, the impacts can be avoided and mitigated.	
Mitigation	• All vehicles should adhere to a low speed limit on site. Heavy vehicles should be restricted to 30km/h and light vehicles to 40km/h. • During decommissioning, driving between sunset and sunrise should be reduced as far possible as this is when Riverine Rabbits are most active and the risk of collisions is highest. • Ensure that riparian areas near to the development footprint are clearly demarcated as no-go areas with appropriate signage and barriers. • No dogs should be allowed on site and precautions to ensure that there is poaching or other direct faunal disturbance on site should be implemented. • Where any roads or overhead lines traverse areas mapped as High Riverine Rabbit habitat sensitivity, any remaining open and disturbed areas after decommissioning should be rehabilitated with local plant species appropriate for the affected habitat. • Should rabbits be killed by traffic, then the traffic management to and from the site should be reviewed in collaboration with the EWT Drylands Programme, to identify additional mitigation and avoidance that should be implemented to further reduce roadkill.	
Residual Risks	Some unavoidable disturbance along the power line route is likely due to decommissioning activities, but likely to be of a short duration and low intensity.	

5.4 CUMULATIVE IMPACTS

Impact Nature: Cumulative impacts on the Riverine Rabbit as a result of habitat loss, disturbance and increased vehicle-related mortality		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Long-term (4)	Long-term (4)
Magnitude	Low (2)	Low (2)
Reversibility	Recoverable (2)	Reversible (1)
Probability	Probable (3)	Low Probability (2)
Significance	Low (30)	Low (18)

Status	Negative	Negative
Irreplaceable loss of resources	No	No
Can impacts be mitigated?	To a large degree, the impacts can be avoided and mitigated.	
Mitigation	• Avoidance of areas of mapped optimal Riverine Rabbit during construction and maintenance activities. • Adherence to the speed limits of 40km/h for light vehicles and 30km/h for heavy vehicles when off of public roads. • Erosion and alien vegetation management along the power line, with annual surveys and annual implementation of clearing and erosion remediation.	
Residual Risks	Some residual habitat loss along the power line route is likely which would contribute to cumulative impacts on this species. The overall extent and significance of this would however be very low.	

6 CONCLUSION & RECOMMENDATIONS

The Mura EGI Corridor includes several areas of riparian habitat with confirmed recent Riverine Rabbit observations, indicating that this species is likely to be present at least occasionally within the affected area. The overall extent of good condition habitat however, represents less than 0.1% of the overall area of occupancy of the Riverine Rabbit and the development would in turn impact less than 1% of the habitat within the corridor, within sub-optimal areas, if all all. As such, this places the relative risk associated with the construction and operation of Mura Grid Connection on the Riverine Rabbit and associated habitat into perspective. Due to the presence of the Riverine Rabbit within the corridor and the condition and extent of habitat, the intact, optimal areas of habitat within the corridor are considered to have a High Site Ecological Importance (SEI). There should be no pylons or new roads located within areas of optimal habitat, and with the suggested avoidance and mitigation, the loss of sub-optimal habitat can be reduced to zero or close to nothing. As a result, the overall long-term impact of the grid connection development on Riverine Rabbits within the Mura EGI corridor and their associated habitat is likely to be low and hence considered acceptable and would not be likely to compromise the local or regional population of this species to any degree.

Impact Statement

Although Riverine Rabbits and associated habitat have been confirmed present within the Mura EGI Corridor, the development footprint within the areas of identified suitable habitat can be reduced to a very low level if no-go areas are avoided. As a result, long-term impacts associated with the Mura grid connection infrastructure on the Riverine Rabbit are likely to be low. Consequently, the development of the Mura EGI corridor is considered acceptable with the implementation of the suggested avoidance and monitoring as indicated.

7 REFERENCES

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South African National Biodiversity Institute (SANBI). 2020. *Species Environmental Assessment Guideline. Guidelines for the implementation of the Terrestrial Fauna and Terrestrial Flora Species Protocols for environmental impact assessments in South Africa*. South African National Biodiversity Institute, Pretoria. Version 1.2020.

Todd, S.W. 2021. Fauna and Flora Specialist Study for the Nuweveld North, East and West WEFs. 3Foxes Biodiversity Solutions for Zutari South Africa.

TERRESTRIAL ANIMAL SPECIES SPECIALIST ASSESSMENT:

KAROO DWARF TORTOISE *CHERSOBIUS BOULENGERI* WITHIN THE MURA SOLAR EGI CORRIDOR

Picture credit: Bonnie Schuman EWT

PRODUCED FOR RED CAP

3Foxes Biodiversity Solutions

Simon.Todd@3foxes.co.za

First Draft – December 2022

NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) AND ENVIRONMENTAL IMPACT REGULATIONS, 2014 (AS AMENDED) – REPORTING REQUIREMENTS FOR SPECIALIST THEMES

GN 1150 of 30 October 2020: Terrestrial Animal Species Specialist Assessment Report (Very High or High Sensitivity)	Section of Report
3.1.1 contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the assessment including a curriculum vitae;	P5
3.1.2 a signed statement of independence by the specialist;	P7
3.1.3 a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	Section 2
3.1.4 a description of the methodology used to undertake the site sensitivity verification, impact assessment and site inspection, including equipment and modelling used where relevant;	Section 2
3.1.5 a description of the mean density of observations/number of sample sites per unit area and the site inspection observations;	Section 2
3.1.6 a description of the assumptions made and any uncertainties or gaps in knowledge or data;	Section 2
3.1.7 details of all SCC found or suspected to occur on site, ensuring sensitive species are appropriately reported;	Section 2
3.1.8 the online database name, hyperlink and record accession numbers for disseminated evidence of SCC found within the study area;	Section 3.3
3.1.9 the location of areas not suitable for development and to be avoided during construction where relevant;	Section 3
3.1.10 a discussion on the cumulative impacts;	Section 3, Section 5
3.1.11 impact management actions and impact management outcomes proposed	Section 3, Section 5
3.1.12 a reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not of the development and if the development should receive approval or not, related to the specific theme being considered, and any conditions to which the opinion is subjected if relevant; and	Section 6
3.1.13 a motivation must be provided if there were any development footprints identified as per paragraph 2.2.12 above [of GN 1150 of 30 October 2020] that were identified as having “low” or “medium” terrestrial animal species sensitivity and were not considered appropriate.	Section 2.4

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SHORT CV/SUMMARY OF EXPERTISE – SIMON TODD

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Kommetjie
7975

Ecological Solutions for People & the Environment

Simon Todd is Director and principal scientist at 3Foxes Biodiversity Solutions and has over 20 years of experience in biodiversity measurement, management and assessment. He has provided specialist ecological input on more than 200 different developments distributed widely across the country, but with a focus on the three Cape provinces. This includes input on the Wind and Solar SEA (REDZ) as well as the Eskom Grid Infrastructure (EGI) SEA and Karoo Shale Gas SEA. He is on the National Vegetation Map Committee as representative of the Nama and Succulent Karoo Biomes. Simon Todd is a recognised ecological expert and is a past chairman and current deputy chair of the Arid-Zone Ecology Forum. He is registered with the South African Council for Natural Scientific Professions (No. 400425/11).

Skills & Primary Competencies

- Research & description of ecological patterns & processes in Nama Karoo, Succulent Karoo, Thicket, Arid Grassland, Fynbos and Savannah Ecosystems.
- Ecological Impacts of land use on biodiversity
- Vegetation surveys & degradation assessment & mapping
- Long-term vegetation monitoring
- Faunal surveys & assessment.
- GIS & remote sensing

Tertiary Education:

- 1992-1994 – BSc (Botany & Zoology), University of Cape Town
- 1995 – BSc Hons, Cum Laude (Zoology) University of Natal
- 1996-1997- MSc, Cum Laude (Conservation Biology) University of Cape Town

Employment History

- 2009 – Present – Sole Proprietor of Simon Todd Consulting, providing specialist ecological services for development and research.
- 2007 Present – Senior Scientist (Associate) – Plant Conservation Unit, Department of Botany, University of Cape Town.

- 2004-2007 – Senior Scientist (Contract) – Plant Conservation Unit, Department of Botany, University of Cape Town
- 2000-2004 – Specialist Scientist (Contract) - South African National Biodiversity Institute
- 1997 – 1999 – Research Scientist (Contract) – South African National Biodiversity Institute

A selection of recent work is as follows:

Strategic Environmental Assessments

Co-Author. Chapter 7 - Biodiversity & Ecosystems - Shale Gas SEA. CSIR 2016.

Co-Author. Chapter 1 Scenarios and Activities – Shale Gas SEA. CSIR 2016.

Co-Author – Ecological Chapter – Wind and Solar SEA. CSIR 2014.

Co-Author – Ecological Chapter – Eskom Grid Infrastructure SEA. CSIR 2015.

Contributor – Ecological & Conservation components to SKA SEA. CSIR 2017.

Recent Specialist Ecological Studies of Relevance to the Current Project

- Nuweveld North, East and West WEFs. Fauna & Flora Specialist Study for EIA. Zutari 2021.
- Beaufort West PV Facility. Fauna & Flora Assessment. SiVest Environmental 2022.
- San Solar PV Facility, Kathu. Fauna & Flora Assessment. Savannah Environmental 2022.
- Soventix Phase 3 PV Facility, De Aar. Fauna & Flora Assessment. Ecologes Environmental Consultants, 2022.
- Sadawa PV Facilities, Tankwa Karoo. Fauna & Flora Assessment. Savannah Environmental 2021.
- Kotulo Tsatsi PV 1 Facility near Kenhardt. Fauna & Flora Assessment. Savannah Environmental 2021.
- Hyperion 2 PV Facility, Kathu. Fauna & Flora Assessment. Savannah Environmental 2021.

SPECIALIST DECLARATION

I, ..Simon Todd....., as the appointed independent specialist, in terms of the 2014 EIA Regulations, hereby declare that I:

- I act as the independent specialist in this application;
- I perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I have no vested interest in the proposed activity proceeding;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- I have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- all the particulars furnished by me in this specialist input/study are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the specialist: 

Name of Specialist: ____Simon Todd_____

Date: ____12 December 2022_____

1 INTRODUCTION

Red Cap Energy (Pty) Ltd is proposing to develop four solar facilities and an associated grid connection, on behalf of four separate Project Applicants, collectively known as the Mura PV Development between Loxton and Beaufort West in the Beaufort West Local Municipality and Ubuntu Local Municipality and the Central Karoo District Municipality and Pixley ka Sema District Municipality. Each solar facility will connect to the Eskom grid via new 132 kV overhead lines (assessed in a separate process to the PV facilities) connecting the two on-site solar substations via adjacent Eskom switching stations to the approved Nuweveld Collector substation. An Electrical Grid Infrastructure (EGI) Corridor is proposed and includes multiple connection routes of up to two 132 kV overhead lines running in parallel and switching stations to enable the connection of the Mura Solar Developments to the approved Nuweveld Collector Substation.

3Foxes Biodiversity Solutions has been appointed by Red Cap Energy to undertake a terrestrial biodiversity assessment of the proposed project in terms of the Environmental Impact Assessment Regulations, 2014, as amended, including the Gazetted specialist protocols (GN R 320 and GN R 1150 of 2020). The DFFE Screening Tool indicates that the Mura EGI Corridor contains areas mapped as Medium Sensitivity for the Karoo Dwarf Tortoise *Chersobius boulengeri* (EN) and the site verification has confirmed the presence of potentially suitable habitat within the corridor and confirmed observations from the broader area. Consequently, in terms of the regulations, a Terrestrial Animal Species Assessment is required for the Karoo Dwarf Tortoise within the Mura EGI Corridor (also referred to as the site or study area). To these ends, this Karoo Dwarf Tortoise Species Assessment for the Mura Grid Connection and associated infrastructure, addresses the potential impacts of the project on the Karoo Dwarf Tortoise and must be included in the BA for the development and any mitigation and monitoring measures as identified, must be incorporated into the EMPr for the development.

1.1 SCOPE OF STUDY

In terms of GN 320 (20 March 2020) and GN 1150 (30 October 2020) of the NEMA EIA Regulations of 2014 (as amended), prior to the commencement of a specialist assessment, a site sensitivity verification must be undertaken to confirm the current land use and environmental sensitivity of the proposed project areas as identified by the Screening Tool. The results of the Site Verification are provided in another report, but of relevance to the current study is that the DFFE Screening Tool identified the site as having a Medium Sensitivity due to the possible presence of the Karoo Dwarf Tortoise. The site verification confirms the presence of suitable habitat for this species within the grid corridor and hence also the medium sensitivity of the site for this species. In terms of the regulations, a Terrestrial Animal Species Impact Assessment is required where the likely presence of a Species of Conservation Concern (SCC is confirmed

within a Medium sensitivity site. In terms of the guidelines and minimum requirements, the Terrestrial Animal Species Impact Assessment should meet the following terms of reference:

2.1 The assessment must be undertaken by a suitably qualified taxon relevant SACNASP registered specialist aligned with the taxa identified in the report generated from the national web based environmental screening tool on the site being submitted as the preferred development site.

2.2 The Terrestrial Animal Species Impact Assessment must include the results of a site assessment undertaken on the preferred development site.

2.3 The Terrestrial Animal Species Impact Assessment must be undertaken in accordance with the Species Environmental Assessment Best Practice Guidelines and must identify the following:

2.3.1 The species of conservation concern which were found on site;

2.3.2 The distribution, location, viability (ability to survive and reproduce in future) and detailed description of population size of the species of conservation concern identified on the preferred development site;

2.3.3 The nature and the extent of the potential impact of the proposed development on the species of conservation concern on the proposed development site;

2.3.4 The importance of the conservation of the population of the species of special concern identified on the proposed development site based on information available in national and international databases including the IUCN Red List of Threatened Species, South African Red List of Species, and/or other relevant databases;

2.3.5 The potential impact of the proposed development on the habitat of the species of conservation concern;

2.3.6 Any dynamic ecological processes occurring within the site and its surrounds that might be disrupted by the proposed development and resulting impact on the identified species of conservation concern; for example, fires in fire-prone systems;

2.3.7 Any potential impact of ecological connectivity (on site, and in relation to the broader landscape) and resulting impact on the identified species of conservation concern;

2.3.8 Buffer distances as per the Species Environmental Assessment Best Practice Guidelines used for the population of each species of conservation concern;

2.3.9 The likelihood of other threatened species, undescribed species or highly localised endemics, migratory species, or species of conservation concern, occurring in the vicinity; and

2.3.10 Identify any alternative development footprints within the preferred development site which would be of “low” sensitivity as identified by the national web based environmental screening tool and verified through the initial site sensitivity verification.

3. **The findings of the Terrestrial Animal Species Impact Assessment must be written up in a Terrestrial Animal Species Impact Assessment Report.**

This report must include as a minimum the following information:

3.1. Contact details and curriculum vitae of the specialist including SACNASP registration number and fields of expertise;

3.2. A signed statement of independence by the specialist;

3.3. Duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;

3.4. A description of the methodology used to undertake the impact assessment and site inspection, including equipment and modelling used where relevant;

3.5. A description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations;

3.6. Areas not suitable for development, to be avoided during construction and operation where relevant;

3.7. Additional environmental impacts expected from the proposed development based on those already evident on the site and a discussion on the cumulative impacts; and

3.8. Impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);

3.9. A reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not of the proposed development and if the proposed development should receive approval or not, and any conditions to which the opinion is subjected;

3.10. A motivation must be provided if there were development footprints identified as per paragraph 2.3.10 above that were identified as having a “low” terrestrial animal species sensitivity and were not considered appropriate.

4. The findings of the Terrestrial Animal Impact Assessment must be incorporated into the Basic Assessment Report (BAR) or the Environmental Impact Assessment Report (EIAR), including the mitigation and monitoring measures as identified, which must be incorporated into the EMPr. A signed copy of the assessment must be appended to the BAR or EIAR.

These Terms of Reference and reporting requirements are achieved in this study and report.

1.2 RELEVANT ASPECTS OF THE DEVELOPMENT

The infrastructure included on the grid connection application includes the following:

- Eight Eskom Switching stations: ▪ Located adjacent to the solar farm substations within the solar area footprint;
- Maximum height of 12m;
- Footprint of up to 150 m x 75 m.
- Four additional up to 150 m x 75 m switching stations located within the corridor;
- ~70 km of overhead 132 kV lines (~40 km will be single overhead 132 kV lines and ~30 km will be up to two overhead 132 kV lines running in parallel running between the switching stations supported by monopole pylons with a max height 38m); and
- Access tracks.

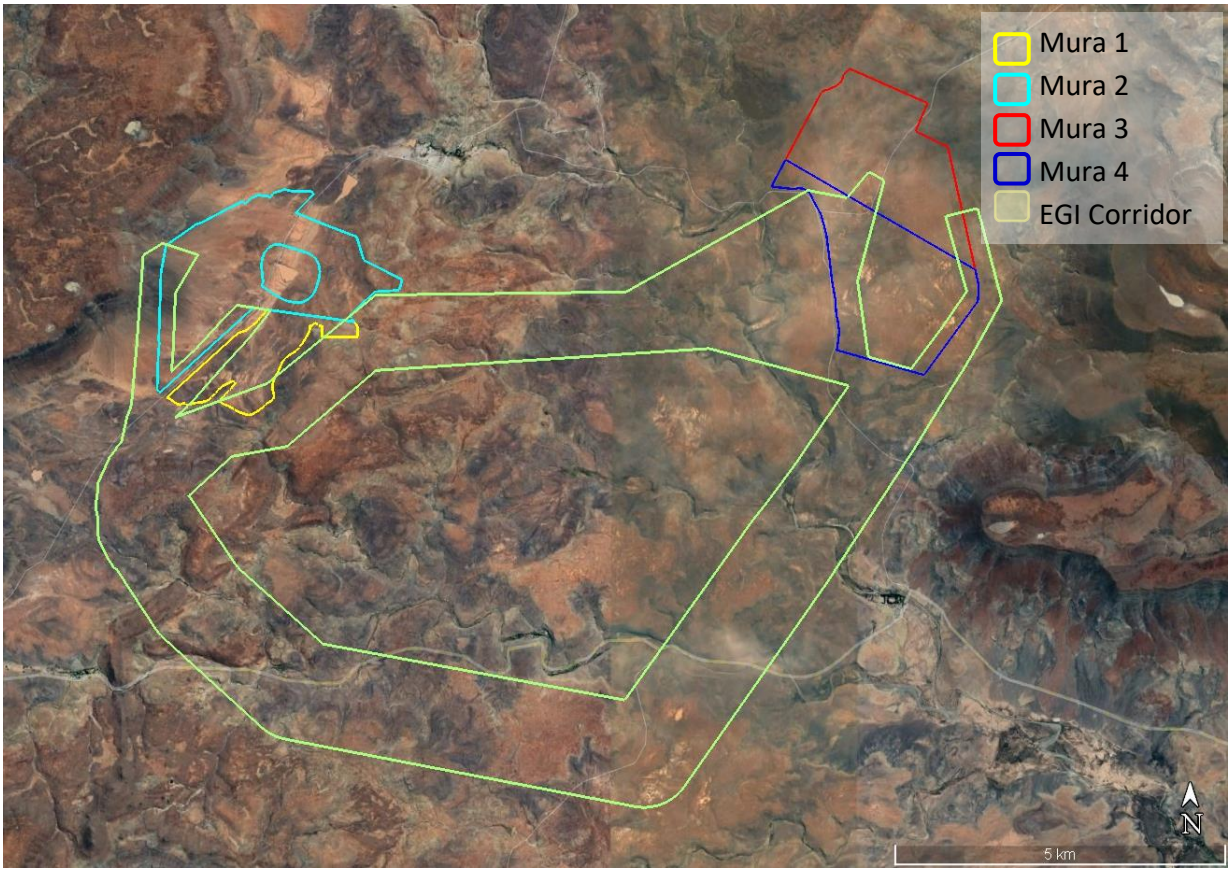

Figure 1. Image showing the regional context and location of the proposed Mura EGI Corridor which links the various Mura PV projects to the Nuweveld Collector Substation.

Table 1. Summary of the components and approximate areas of impact within the Mura Grid Connection Corridor and associated infrastructure.

Project Components	Description	Disturbance footprint
Switching stations	There will be up to two Eskom switching stations on each solar farm with a footprint of approximately 150 x 75 m (11,250 m^2). The switching station area will include all the standard switching station electrical equipment/components, such as bus bars, metering equipment, switchgear, and will also house control, operational, workshop and storage buildings/areas. Additional switching stations are also proposed outside of the solar farm footprint.	13
Overhead lines and pylons	~70 km of overhead 132 kV lines (~40 km will be single overhead 132 kV lines and ~30 km will be up to two overhead 132 kV lines running in parallel running between the switching stations supported by monopole pylons with a max height 38m. The spans (distance between pylons) on the monopole pylons (without stays) are on average 260 m.	2,5

Access roads and tracks	Existing access roads and tracks (upgraded to ± 2-4 m wide where needed) will be used as far as possible and new access tracks would be created where needed (±2-4 m wide). These are required for all project phases.	32
Temporary areas	Temporary laydown areas will be identified along the alignment, with the main equipment and construction yards being located along the alignment or based in one of the surrounding towns or at the solar site camp. It is anticipated that the total area required for the temporary laydown areas is up to 2 ha and two will be required.	4
Total disturbance footprint:	**Temporary**	4
Total disturbance footprint:	**Permanent**	48
	TOTAL	52

2 METHODOLOGY

2.1 HABITAT DELINEATION

In order to assess the availability, distribution and extent of potential Karoo Dwarf Tortoise habitat within the Mura EGI Corridor, satellite imagery was used to delineate and map areas of potential habitat. Such areas can be reasonably easily delineated from satellite imagery due to the specific habitat requirements of the Karoo Dwarf Tortoise. According to the IUCN 2018 Red List Assessment for this species (Hofmeyr et al. 2018), *Chersobius boulengeri* is habitat specialist that occurs in association with dolerite ridges and rocky outcrops of the Nama and Succulent Karoo. The tortoises usually take shelter under rocks in vegetated areas or in rock crevices (Boycott and Bourquin 2000), but few rocky sites over the range offer suitable retreats for the species. Populations are considered to be relatively isolated within areas of suitable habitat and movement between such patches is expected to be low. As such, suitable areas of habitat can be relatively easily recognised and mapped from satellite imagery. In addition, it is also possible to at least some degree differentiate between likely high-quality habitat associated with dolerite outcrops and ridges from lower quality shale and mudstone slopes that appear to be less favoured. The areas of suitable habitat were also investigated and noted in the field where present in order to verify the mapping results.

2.2 LIMITATIONS & ASSUMPTIONS

A number of limitations and assumptions are inherent in the study including the following:

- The presence of the Karoo Dwarf Tortoise within the areas of suitable habitat present within the corridor could not be directly confirmed for the current study. This species has a low detectability and may be active for as little as 10 minutes a day, making it very difficult to confirm presence and density.

- In order to ensure a conservative approach, all areas with suitable habitat are assumed or treated as if they have Karoo Dwarf Tortoises present. Clearly this is not the case as not all areas of suitable habitat would be occupied. As such, the assessment is designed to assess the worst-case scenario with regards to the distribution of the tortoise within the corridor.
- It is assumed that there are no Karoo Dwarf Tortoises resident in areas outside of the rocky hills habitat typically associated with this species. This is considered to be a reasonable assumption as this species is known to be strongly associated with rocky hills and does not occur within areas without sufficient shelter.

2.3 DFFE SITE VERIFICATION

Government Notice No. 320, dated 20 March 2020, includes the requirement that an Initial Site Sensitivity Verification Report must be produced for a development footprint. The outcomes of the Site Verification Report determine the level of assessment required for the site (including that a Karoo Dwarf Tortoise species assessment be undertaken). The Site Sensitivity Verification Report for Terrestrial Ecology is included as an Annex to the Terrestrial Biodiversity Theme Assessment for the project and is not repeated here.

3 KAROO DWARF TORTOISE SPECIES ASSESSMENT

3.1 KAROO DWARF TORTOISE SPECIES ACCOUNT

The majority of the following species account is taken from the SANBI species account for *Chersobius boulengeri* as well as various scientific publications on this species including Loehr and Keswick (2022), Loehr et al. (2021), the IUCN Red List assessment for this species (Hofmeyr et al. 2018).

Chersobius boulengeri occurs in association with dolerite ridges and rocky outcrops of the southern Succulent and Nama Karoo biomes, and peripherally in the Albany Thicket biome in the southeast, at altitudes of approximately 800 to 1,500 m. The vegetation usually consists of dwarf shrubland that often contains succulent and grassy elements. The tortoises usually take shelter under rocks in vegetated areas or in rock crevices. However, these are quite specific in terms of their requirements with the result that suitable retreats for the species are not common. Females nest in summer and have single-egg clutches. No information exists on age at maturity and longevity, but based on the life history of *Chersobius signatus* (Loehr et al. 2007), female *C. boulengeri* are expected to mature at 10-12 years of age.

Due to their strong habitat association, populations are isolated on rocky outcrops with specialized vegetation. Recent surveys for this species indicate that many populations have disappeared

and that population numbers have declined significantly (Hofmeyr et al. 2018). The reasons for the current population decline are not well known. However presumed threats to this species include habitat degradation, drought and agricultural overgrazing as well as climate change and increased levels of predation by crows in particular.

The motivation for the red-listing of *Cherobius boulengeri* as Endangered under criterion A4ace, based on an estimate of a reduction in population size of approximately 30% over the past 25 years (one generation), and a projected reduction of at least another 30% over the next 50 years (two generations), for a total reduction over three generations of approximately 60%.

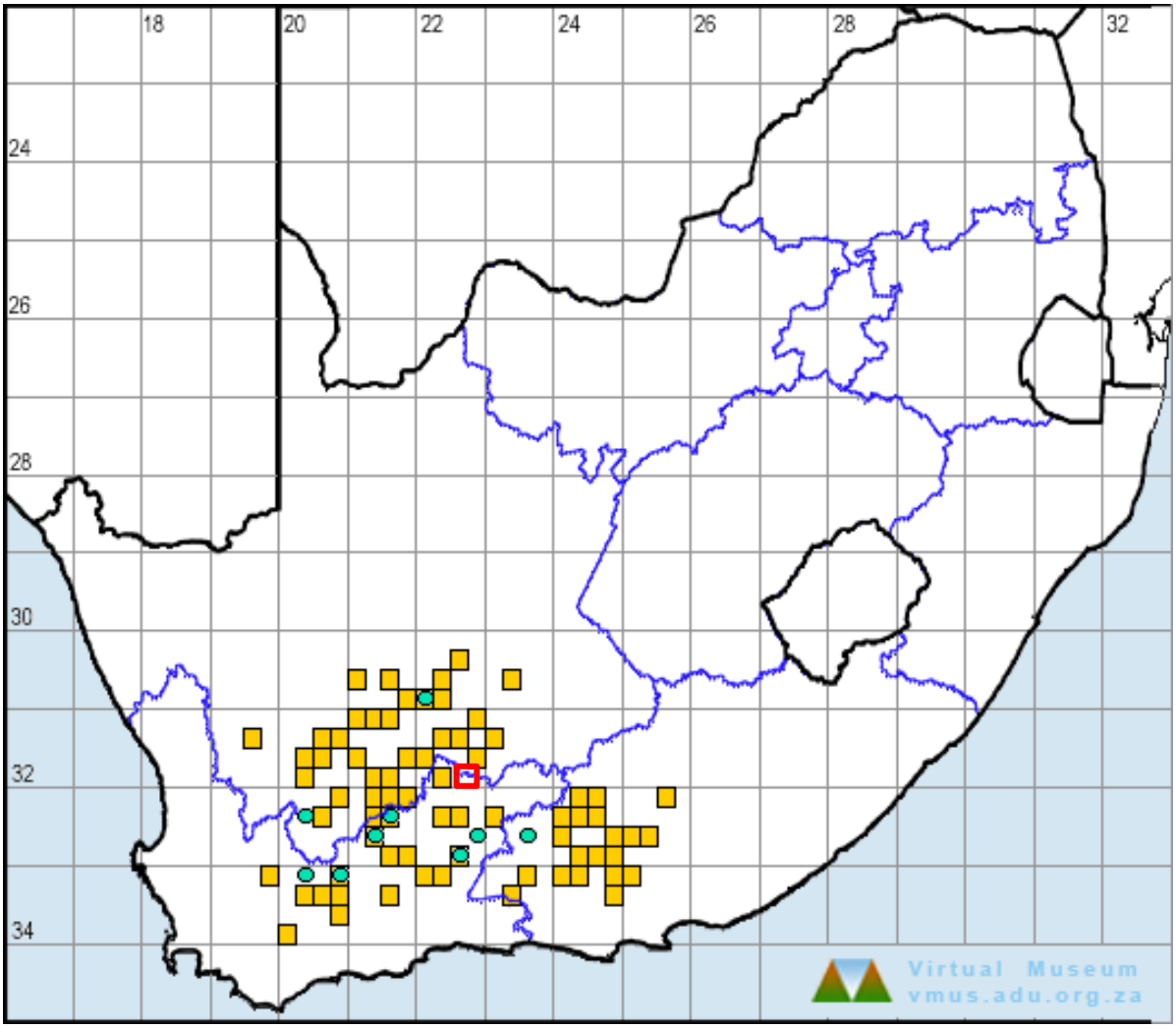

Figure 2. Historical and recent distribution records for the Karoo Dwarf Tortoise according to the Virtual Museum records. The approximate location of the Mura EGI Corridor is indicated in red.

3.2 HABITAT SUITABILITY ASSESSMENT

There are fairly extensive tracts of potentially suitable habitat for the Karoo Dwarf Tortoise within the Grid Corridor (Figure 3, Figure 4), especially within the southern EGI corridor. The areas of habitat have been split into areas considered to represent favourable habitat (Figure 4) and areas

considered to be less favourable/sub-optimal and hence less likely to harbour Karoo Dwarf Tortoise. The total extent of favourable habitat within the corridor is estimated at 438 ha, while the areas of suboptimal habitat is estimated at 452 ha (see Figure 5); which together represent approximately 20% of the total EGI Corridor area. However, in this regard it is important to note that the areas of suitable habitat are not within the areas that would be affected by the switching stations or other areas of significant footprint and would be affected only by the pylons and service roads.

Figure 3. Dolerite ridge and rocky slope from within the Mura EGI Corridor considered to represent potential habitat for the Karoo Dwarf Tortoise.

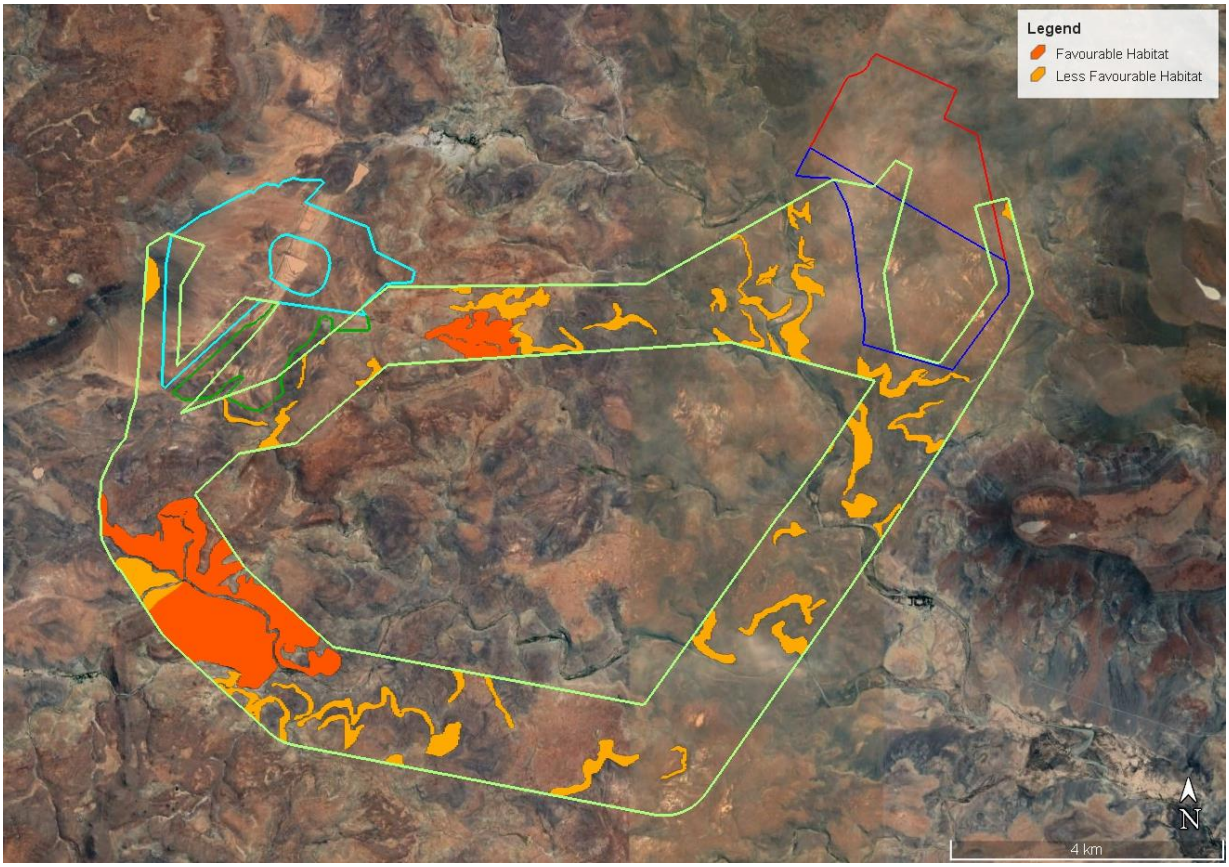

Figure 4. Map of areas considered to represent potentially suitable Karoo Dwarf Tortoise habitat within the Mura EGI Corridor based on ground-truthed mapping from satellite imagery.

Since some of the ridge systems which have been mapped as favourable habitat for the Karoo Dwarf Tortoise are quite extensive within the corridor and cannot be fully avoided, there will inevitably be some habitat loss resulting from the power line development. Based on the preliminary routing presented in the BAR, the total footprint within the areas of suitable habitat is conservatively estimated at 7 ha (due to roads & pylons footprints).

3.3 SITE ECOLOGICAL IMPORTANCE

The Terrestrial Animal/Plant Species Protocols require specialists to identify:

- the nature and the extent of the potential impact of the proposed development on species of conservation concern occurring on the proposed development site;
- the potential impact of the proposed development on the habitat of the species of conservation concern; and
- any alternative development footprints within the preferred development site which would be of 'low' sensitivity as identified by the screening tool and verified through the site sensitivity verification.

In order to spatially identify the different areas of importance for a species for a proposed development site and to facilitate transparent and comparable reporting of the potential impacts of development, a standardised metric for identifying site-based ecological importance for species, in relation to a proposed project with a specific footprint/ project areas of influence (PAOI) and suite of anticipated activities. It allows for rapid spatial inspection and evaluation of impacts of proposed developments within the context of on-site habitats and Species of Conservation Concern (SCC), and also facilitates integration of inputs from different specialist studies. This process is necessary because the screening tool evaluates 'environmental sensitivity' at a larger scale than that of a proposed development site and frequently includes modelled data that require field verification. This assessment relies on the data collected during the necessary specialist surveys to provide a current evaluation of the on-site habitat conditions. This assessment does not replace the output of the screening tool but is more specific to the proposed development footprint/PAOI and proposed project activities. Where the site-specific assessment produces lower or higher Site Ecological Importance (SEI) classification than the 'environmental sensitivity' output of the screening tool for that particular site, it is the responsibility of the specialist to provide a clear and defensible justification for the difference.

The SEI is considered to be a function of the biodiversity importance (BI) of the receptor (e.g., species of conservation concern, the vegetation/fauna community or habitat type present on the site) and its resilience to impacts (receptor resilience [RR]) as follows:

- SEI = BI + RR

BI in turn is a function of conservation importance (CI) and the functional integrity (FI) of the receptor as follows:

- BI = CI + FI

Given the IUCN status of the Karoo Dwarf Tortoise is Endangered under criterion A4ace and, the **Conservation Importance** of the site is considered to be **High**. As the important rocky hills habitat has experienced very little direct transformation to date, it is considered to have **High Functional Integrity**. As the CI and FI are both High, the BI of the site is considered to be High as well. The habitat within the corridor is considered to have a Medium resilience. Thus, the overall **SEI** of suitable habitat for the Karoo Dwarf Tortoise in the corridor **is considered to be High** (Figure 5.). In terms of the species assessment guidelines, the implications for the High SEI rating for suitable Karoo Dwarf Tortoise habitat at the site indicates that the following general measures are considered appropriate for these areas - "*Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted; limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities*."

It is not possible to provide a reliable estimate of the population size within the Mura EGI Corridor. Firstly, there are no reliable estimates of population density for this species that can be extrapolated across the range and secondly, the reported population declines appear to be widespread with the result that it is not possible to ascertain what proportion of the suitable habitat within the corridor would actually be occupied. However, in order to assess the relative importance of the area impacted by the power line, the whole of the EGI corridor has an area of 4328 ha (43.28 km^2) which compares to the Area of Occurrence of this species of 13 5090 km^2. The Mura EGI corridor therefore occupies less than 0.05% of the Area of Occurrence of this species and assuming a similar level of occupancy across the range, this would amount to less than 0.05% of the population. Again, assuming an even distribution of impact within the corridor for the access road and power line, which would represent a worst-case scenario, the maximum footprint within areas mapped as potentially suitable for the Karoo Dwarf Tortoise would be 7ha. Direct habitat loss within the corridor would amount to less than 1% of the mapped suitable habitat present, with the result that direct habitat loss would be minimal and is not considered a significant threat resulting from the development.

3.4 KAROO DWARF TORTOISE SPATIAL ASSESSMENT

The overall direct (primary) extent of habitat loss within the areas identified as being important to the Karoo Dwarf Tortoise is conservatively estimated at approximately 7 ha, which is a very small proportion of the available habitat within the corridor and the wider area. An indirect/secondary influence from the proposed grid may result from the use of the pylons by crows for nesting purposes. This represents a potential secondary impact because crows frequently prey on tortoises, especially when breeding (Joseph et al. 2017). This is likely to be a particular problem in areas where there are currently few available nesting sites. In such areas the power line would have the potential to increase crow density and hence predation of tortoises by crows. Given the low reproductive rate of the Karoo Dwarf Tortoise, even relatively low levels of predation would be likely to have significant negative impacts on local tortoise populations. It is therefore recommended that the pylons are designed in a manner which discourages the use of the pylons by crows for nesting. The Project Area of Influence (PAOI) is therefore considered to extend no more than 1-2km from the power line within suitable habitat for the Karoo Dwarf Tortoise.

For the grid, buffers around the areas of habitat were not applied and are not considered necessary as the presence of the power line would not significantly disrupt the habitat for the tortoise. In order to mitigate potential negative impacts of the power line on the Karoo Dwarf Tortoise through avoidance and changes to the layout of the development, the following avoidance and mitigation should be implemented:

- Areas of suitable Dwarf Tortoise habitat that have been mapped as having a High SEI should be avoided by the grid routing (pylon placement) wherever possible. Along the southern grid corridor, the grid route should ideally follow the existing public road and/or

the alignments of the Nuweveld Gridline and the proposed Gamma Gridline as far as possible through the mapped area of habitat as this would reduce additional habitat loss and disturbance to habitat.

- The pylons within and near (within 1km) areas of suitable habitat should be designed so as to discourage crows from nesting on the structures.
- Crow nests should be removed from the pylons within and near (within 1 km) mapped areas of suitable habitat regularly.

As a result of the implementation of the above avoidance mitigation, the overall development footprint of the grid within Karoo Dwarf Tortoise habitat can be reduced to a minimal amount considered to represent a low direct impact potential.

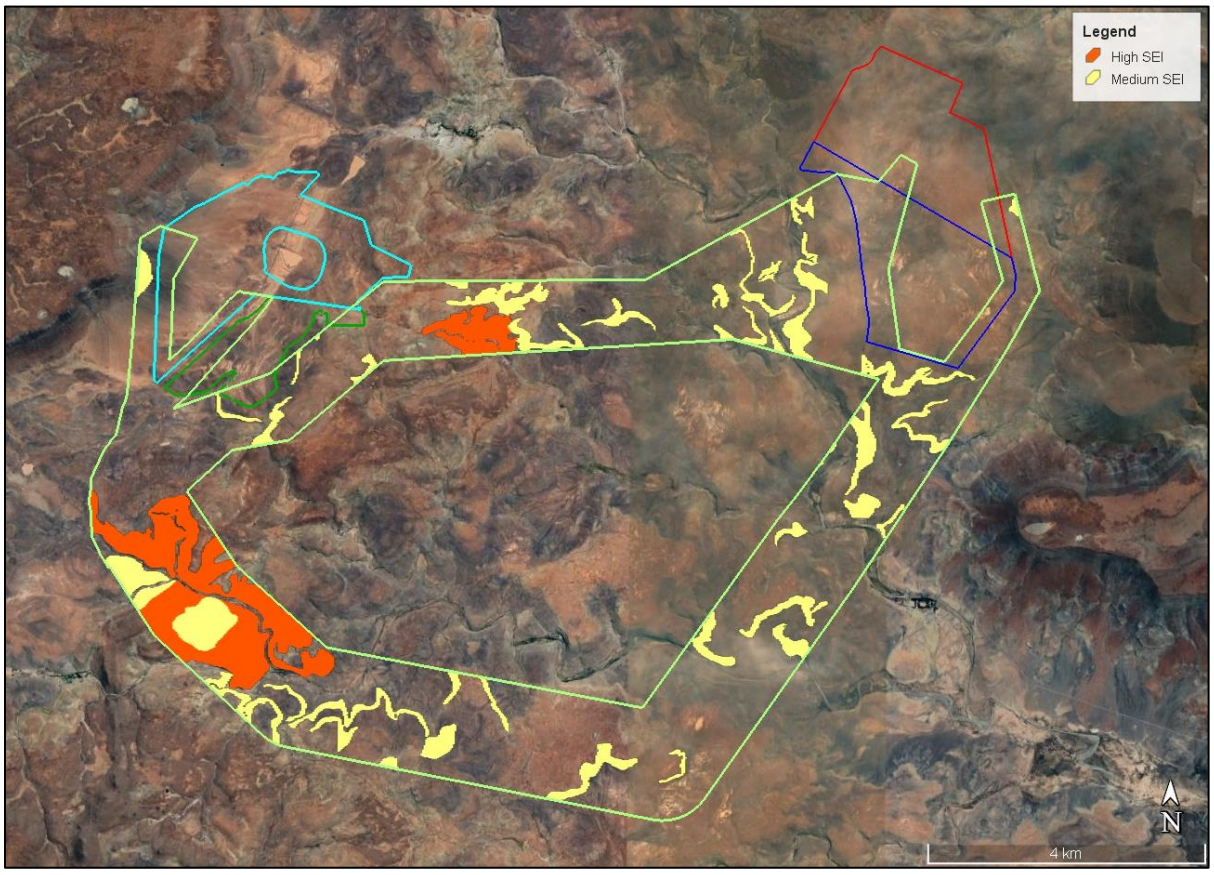

Figure 5. SEI for the Karoo Dwarf Tortoise within the Mura EGI Corridor.

In terms of broader cumulative impacts on the Karoo Dwarf Tortoise, the increase in renewable energy development in the Loxton area is a potential concern for the Karoo Dwarf Tortoise. The primary impact would likely be from habitat loss and possibly an increase in predation rates. Although there are currently no built or preferred bidders in the area, there are numerous planned and approved projects in the area including the adjacent Nuweveld suite of projects as well as the nearby Hoogland North projects. The current Mura suite of PV projects would add to the habitat loss associated with the approved and planned wind energy facilities. The areas of high-

quality habitat, that being areas of dolerite slopes with sufficient shelter and cover, have largely been mapped as no-go areas in all these projects with the result that the overall level of habitat loss for the Karoo Dwarf Tortoise would be relatively low and would amount to less than 50ha on a cumulative basis.

4 IMPACTS AND ISSUES IDENTIFICATION

4.1 IDENTIFICATION OF POTENTIAL IMPACTS

The development of the Mura EGI Corridor would result in a number of potential impacts on the Karoo Dwarf Tortoise during the construction and operational phases of the development. During construction, the major impact would likely be habitat loss and disturbance while during the operational phase, direct disturbance would be reduced but there would still be some potential indirect impact due to increased crow predation. The following impacts are identified as the major impacts that are likely to be associated with the development of the Mura EGI Corridor on the Karoo Dwarf Tortoise and their associated habitat.

Impact 1. Construction-Phase Impact on the Karoo Dwarf Tortoise

During construction, the increased levels of traffic within as well as to and from the corridor would likely increase collision risk with tortoises. Furthermore, the construction activities would result in some habitat loss and degradation within areas of suitable habitat.

Impact 2. Operational-Phase Impact on the Karoo Dwarf Tortoise

During operation, impacts would likely be reduced, but occasional anthropogenic disturbance associated with maintenance activities along the power line would potentially impact the Karoo Dwarf Tortoise. In addition, the power line could increase the abundance of corvids near the power line, resulting in increased Karoo Dwarf Tortoise predation.

Impact 3. Cumulative Impact on Karoo Dwarf Tortoise

The development would contribute to cumulative impacts on the Karoo Dwarf Tortoise due to habitat loss and habitat degradation. The additional contribution of the grid line to habitat loss would however be relatively low as there would be significant avoidance of optimal Karoo Dwarf Tortoise habitat. It is possible that there would be some habitat degradation within Karoo Dwarf Tortoise habitat due to the presence of the service road beneath the grid line, but a more likely source of habitat degradation would be from increased levels of crow predation in areas in proximity to the grid line. The extent over which this latter effect would take place is considered to be relatively limited as there are existing power and telephone lines in several sections of the corridor and it would also likely run adjacent to roads in numerous other sections.

5 ASSESSMENT OF IMPACTS ON KAROO DWARF TORTOISE

An assessment of the likely significance of the impacts identified above is made below for the Mura EGI Corridor on the Karoo Dwarf Tortoise.

5.1 CONSTRUCTION PHASE IMPACTS ON KAROO DWARF TORTOISE

Impact Nature: Impacts on Karoo Dwarf Tortoise as a result of construction phase activities, including vehicle collisions, disturbance and habitat loss.		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Short-term (2)	Short-term (2)
Magnitude	Low (2)	Low (2)
Reversibility	Recoverable (3)	Recoverable (3)
Probability	Highly Probable (4)	Probable (3)
Significance	Moderate (36)	Low (27)
Status	Negative	Negative
Irreplaceable loss of resources	No	No
Can impacts be mitigated?	To some degree, but the habitat loss associated with the project is largely unavoidable.	
Mitigation	• Limit the placement of pylons and access tracks in areas mapped as being of high SEI for the Karoo Dwarf Tortoise as far as possible. • The pylons located within and near (<1km) the areas of mapped Karoo Dwarf Tortoise habitat should be of a design that discourages the use of the pylons for nesting by crows. • All vehicles should adhere to a low-speed limit on site. Heavy vehicles should be restricted to 30km/h and light vehicles to 40km/h. • Construction staff should remain within the construction footprint and access routes and should not be allowed to wander into the veld. • No fauna including tortoises should be disturbed or removed from the veld. • No holes or trenches should be left open for extended periods as tortoises may fall in and become trapped. Trenches should have soils ramps present that allow for tortoises and other fauna to escape. Holes should also be checked regularly for tortoises and other fauna that may have fallen in. • Search and Rescue before construction clearing of areas of high-quality habitat withing the development footprint as identified and mapped during a preconstruction walk-through of the power line.	

Residual Risks	Habitat loss within the areas of suitable habitat cannot be entirely avoided with the result that some residual habitat loss and local disturbance, will occur.

5.2 IMPACTS ON KAROO DWARF TORTOISES DURING OPERATION

Impact Nature: There would potentially be impact on Karoo Dwarf Tortoises at the site during operation due to operational activities (vehicles/disturbance) as well as predation by crows.		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Long-term (4)	Long-term (4)
Magnitude	Low (2)	Low (2)
Reversibility	Recoverable (3)	Reversible (1)
Probability	Probable (3)	Low Probability (2)
Significance	Moderate (33)	Low (18)
Status	Negative	Negative
Irreplaceable loss of resources	No	No
Can impacts be mitigated?	To a large degree, the impacts can be avoided and mitigated.	
Mitigation	• Crow nests identified during annual surveys and located within 1km of suitable Karoo Dwarf Tortoise habitat should be removed. • Apply additional mitigation in consultation with a terrestrial ecologist to prevent roadkill mortalities and / or discourage predation of Karoo Dwarf Tortoise by crow if monitoring demonstrates these aspects to be the cause of persistent impacts on this species. • Conduct annual surveys along the powerline to census crow nesting sites, and log tortoise carcasses observed along the powerline and especially under any crow nests if present.	
Residual Risks	Some residual disturbance along the power line route is possible due to operation and maintenance activities, but likely to be of a low duration and intensity.	

5.3 DECOMMISSIONING PHASE IMPACTS ON KAROO DWARF TORTOISES

Impact Nature: Impacts on Karoo Dwarf Tortoise as a result of decommissioning phase activities, including vehicle collisions, disturbance.		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)

Duration	Short-term (2)	Short-term (2)
Magnitude	Low (2)	Low (2)
Reversibility	Recoverable (3)	Recoverable (3)
Probability	Probable (3)	Low Probability (2)
Significance	Low (27)	Low (18)
Status	Negative	Negative
Irreplaceable loss of resources	No	No
Can impacts be mitigated?	To a large degree, the impacts can be avoided and mitigated.	
Mitigation	• All vehicles should adhere to a low-speed limit on site. Heavy vehicles should be restricted to 30km/h and light vehicles to 40km/h. • Decommissioning staff should remain within the power line footprint areas and access routes and should not be allowed to wander into the veld. • No fauna including tortoises should be disturbed or removed from the veld. • No holes or trenches should be left open for extended periods as tortoises may fall in and become trapped. Trenches should have soils ramps present that allow for tortoises and other fauna to escape. Holes should also be checked regularly for tortoises and other fauna that may have fallen in. • No litter or other material from the power line or decommissioning activity should be left lying around as tortoises and other fauna may become trapped in fibres, plastic and other waste material.	
Residual Risks	Some unavoidable disturbance along the power line route is likely due to decommissioning activities, but likely to be of a short duration and low intensity.	

5.4 CUMULATIVE IMPACTS ON THE KAROO DWARF TORTOISE

Impact Nature: Cumulative impacts on the Karoo Dwarf Tortoise as a result of habitat loss, disturbance and increased predation and poaching.		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Long-term (4)	Long-term (4)
Magnitude	Low (2)	Low (2)
Reversibility	Recoverable (3)	Reversible (1)
Probability	Low Probability (2)	Low Probability (2)
Significance	Low (22)	Low (18)

Status	Negative	Negative
Irreplaceable loss of resources	No	No
Can impacts be mitigated?	To a large degree, the impacts can be avoided and mitigated.	
Mitigation	• Rehabilitation of disturbed areas and annual monitoring and management of erosion and alien vegetation along the power line. • Annual monitoring and action to ensure that crow nests are removed from the line where present.	
Residual Risks	Some residual habitat loss along the power line route is likely which would contribute to cumulative impacts on this species. The overall extent and significance of this would however be very low.	

6 CONCLUSION & RECOMMENDATIONS

The Mura EGI Corridor includes a few rocky ridges and mountainous areas considered to represent potentially suitable habitat for the Karoo Dwarf Tortoise. As some of these are quite extensive within the corridor, it would not be possible to entirely avoid these areas. Consequently, some direct habitat loss for the Karoo Dwarf Tortoise within these areas is inevitable but has been estimated at no more than 7ha. This is insignificant when considered in context of the range of this species. Direct habitat loss is therefore not considered to represent a significant source of potential impact associated with the Mura EGI Corridor on the Karoo Dwarf Tortoise.

During operation, there is a risk that the pylons would attract crows and increase the local density of crows, thereby increasing predation levels on the Karoo Dwarf Tortoise. Given the low reproductive rate of the Karoo Dwarf Tortoise, even relatively low levels of predation would be likely to have significant long-term negative impacts on local tortoise populations. It is therefore recommended that the pylons are designed in a manner which discourages the use of the pylons by crows for nesting, and that crow nests are removed regularly from pylons within and near (1km) suitable Karoo Dwarf Tortoise habitat as mapped in this assessment.

Provided that the various mitigation and avoidance measures as suggested are implemented, the overall long-term impact of the grid connection development on Karoo Dwarf Tortoises and associated habitat is likely to be low and hence considered acceptable.

Impact Statement

The direct impact of the Mura EGI Corridor on the Karoo Dwarf Tortoise would be low and is not considered significant. Indirect impacts, particularly predation by crows would potentially represent a more persistent, long-term threat to the Karoo Dwarf Tortoise. However, with the implementation of the suggested mitigation and avoidance measures, it is likely that his impact can be reduced to an acceptable, low level. Consequently, the development of the Mura EGI Corridor is considered acceptable with the implementation of the suggested avoidance and

monitoring as indicated and should be allowed to proceed with regards to potential impacts on the Karoo Dwarf Tortoise.

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