TERRESTRIAL ANIMAL SPECIES SPECIALIST ASSESSMENT:

RIVERINE RABBIT *BUNOLAGUS MONITICULARIS* ON THE KLIPKRAAL 4 WIND ENERGY FACILITY

PRODUCED FOR SIVEST ON BEHALF OF AURA DEVELOPMENT COMPANY

3Foxes Biodiversity Solutions

Simon.Todd@3foxes.co.za

First Draft – July 2023

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

Simon Todd Pr.Sci.Nat
Director & Principle Scientist
C: 082 3326502
Simon.Todd@3foxes.co.za

23 De Villiers Road
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 in the Vicinity of the Current Site

Environmental Impact Assessment for the Proposed Komsberg East and Komsberg West Wind Farms and Associated Grid Connection Infrastructure: Fauna & Flora Specialist Impact Assessment. Arcus Consulting 2014.

Proposed Rietkloof & Brandvallei Wind Farms and Associated Grid Connection Infrastructure: Fauna & Flora Specialist Impact Assessment Report. EOH 2016.

Proposed Gunstfontein Wind Farm and Associated Grid Connection Infrastructure: Fauna & Flora Specialist Impact Assessment Report. Savannah Environmental 2016.

Mainstream South Africa Dwarsrug Wind Energy Facility: Fauna & Flora Specialist Impact Assessment Report. Sivest 2014.

Phezukomoya and San Kraal Wind Energy Facilities and associated grid connection. Fauna and Flora specialist studies. Arcus Consulting 2018.

Kokerboom Wind Energy Facilities (1-4) and associated grid connections. Fauna and Flora specialist studies. Aurecon 2017.

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: ____05 January 2023_____

1 INTRODUCTION

Aura Development Company (Pty) Ltd is proposing to develop the Klipkraal 4 Wind Energy Facility 3 on a ca. 1330 ha site situated about 30km southeast of Fraserburg, within the Karoo Hoogland Local Municipality, Namakwa District Municipality, Northern Cape. The development would have a maximum output of 240MW and a maximum of 30 turbines.

SiVEST are conducting the required EIA process and 3Foxes Biodiversity Solutions has been appointed by SiVEST, on behalf of Aura Development Company (Pty) Ltd to provide a Terrestrial Animal Species Assessment for the proposed Klipkraal 4 Wind Farm as part of the EIA application. The DFFE Screening Tool indicates that the Klipkraal 4 site contains areas mapped as High Sensitivity for the Riverine Rabbit *Bunolagus monticularis* and the site verification has confirmed the presence of the Riverine Rabbit on site as well as the High Sensitivity ranking of the site. Consequently, in terms of the regulations, a Terrestrial Animal Species Assessment is required for the Riverine Rabbit within the Klipkraal 4 Wind Farm. To these ends, this Riverine Rabbit Species Assessment for the Klipkraal 4 Wind Farm, addresses the potential impacts of the Klipkraal 4 Wind Farm on the Riverine Rabbit and must be included in the EIA 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 and GN 1150 (20 March 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 High Sensitivity due to the presence of the Riverine Rabbit *Bunolagus monitcularis* (CR). The site verification confirms the presence of the Riverine Rabbit on the site and hence also the high sensitivity of the site for this species. In terms of the regulations, a Terrestrial Animal Species Impact Assessment is required when a site is confirmed as being of high or very high sensitivity for a faunal species. 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.

1.2 PROJECT LOCATION

The Klipkraal Wind Energy Facility 3 is part of the Klipkraal Cluster and is located approximately 30 km southeast of Fraserburg in the Northern Cape. The layout and location of the Klipkraal Wind Energy Facility 3 is illustrated below in Figure 1 and includes up to 40 potential turbine locations with a maximum output of 240 MW.

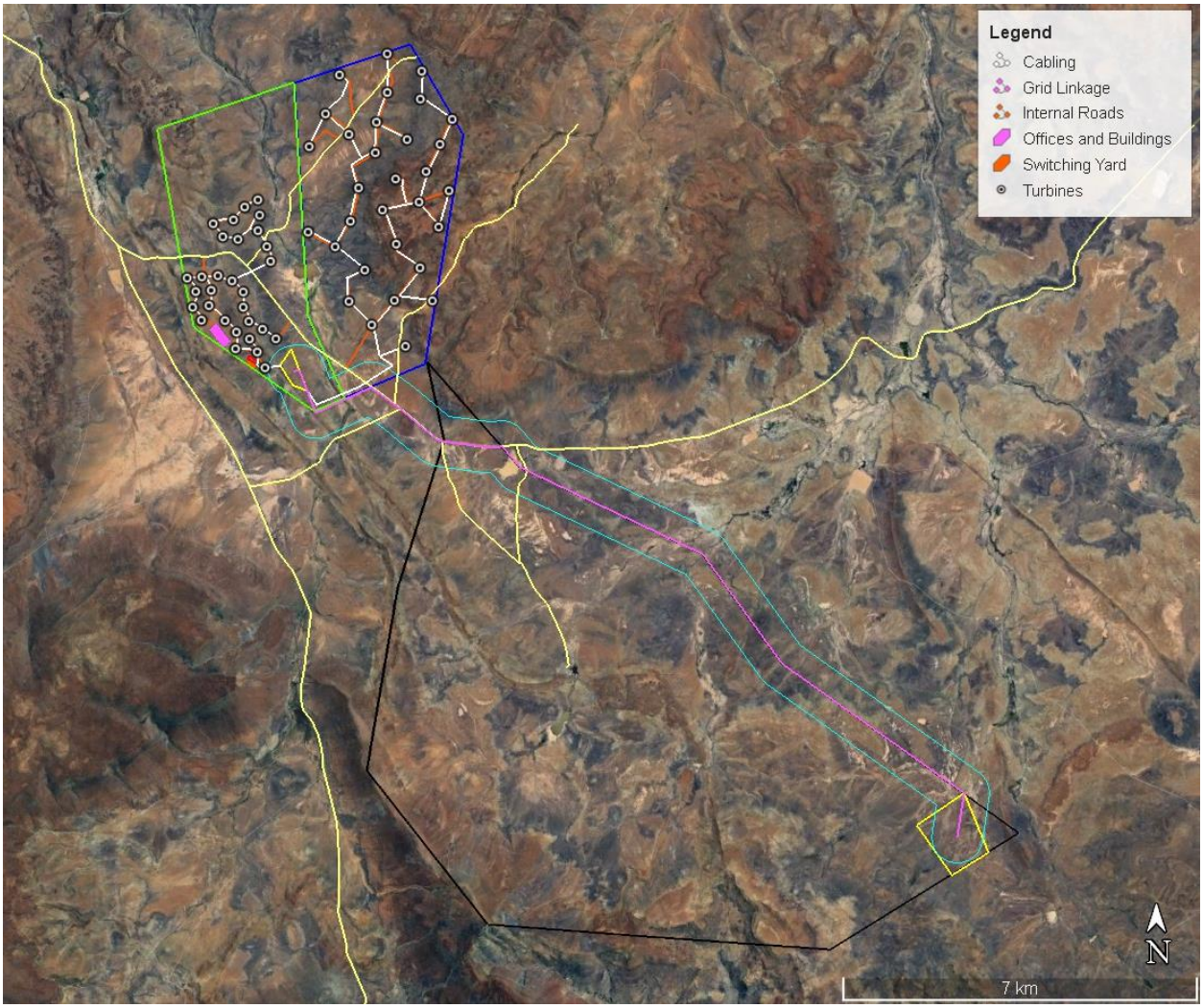

Figure 1. Satellite image showing the location of the proposed Klipkraal 4 Wind Farm, southeast of Fraserburg, as well as the adjacent Klipkraal 5 Wind Farm, east of the Klipkraal 4.

1.3 PROJECT DESCRIPTION

The Klipkraal 4 Wind Energy Facility is part of the Klipkraal Cluster and is located approximately 30 km southeast of Fraserburg in the Northern Cape. The layout and location of the Klipkraal Wind Energy Facility 3 is illustrated above in Figure 1 and includes up to 30 potential turbine locations with a maximum output of 240 MW. The estimated total permanent footprint of the Klipkraal 4 Wind Energy Facility is estimated at 120ha. The electricity generated by the proposed

WEF development will be fed into the national grid via a 132kV/400kV overhead power line. A Battery Energy Storage System (BESS) will be located next to the onsite 33/132kV substation.

2 METHODOLOGY

2.1 HABITAT DELINEATION

In order to assess the availability, distribution and extent of potential Riverine Rabbit habitat within the Klipkraal 4 site, satellite imagery was used to delineate and map areas of possible 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 Damfontein se Rivier, which is tributary of the Sak 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 site.

2.2 CAMERA TRAPPING

Although it is relatively easily to delineate areas of potential habitat, confirming the presence of Riverine Rabbits within these areas is more difficult as this species is shy and not easily observed in the field. As a result, camera trapping was used to assess the presence of Riverine Rabbits within the major areas of potential habitat that were identified in the mapping procedure, across the whole of the Klipkraal cluster of wind farms. Although there was a strong focus on camera trapping within the areas considered to be optimal habitat, minor drainage features and areas considered to be marginal in terms of habitat type and condition were also included in the camera trapping to ensure that no areas where this species could be present were missed. The camera trapping was informed by the Riverine Rabbit Camera Trapping Guidelines developed by Endangered Wildlife Trust (EWT) specifically for the assessment of Riverine Rabbits within wind farm developments. Camera trapping on Phase 1-4 of the Klipkraal Cluster was conducted from 22nd of June to 4-5th September 2021, giving rise to 10 weeks of camera trapping. Within the Klipkraal Phase 4 and 5 area, the camera trapping was conducted from 30 June 2022 to 15 December 2023. A minimum of 6 weeks is considered adequate in terms of the EWT guidelines. A total of 36 camera locations were used to inform the study, distributed across the six phaases of the Klipkraal cluster. The camera locations within the Klipkraal 4 and 5 project areas is depicted below in Figure 2.

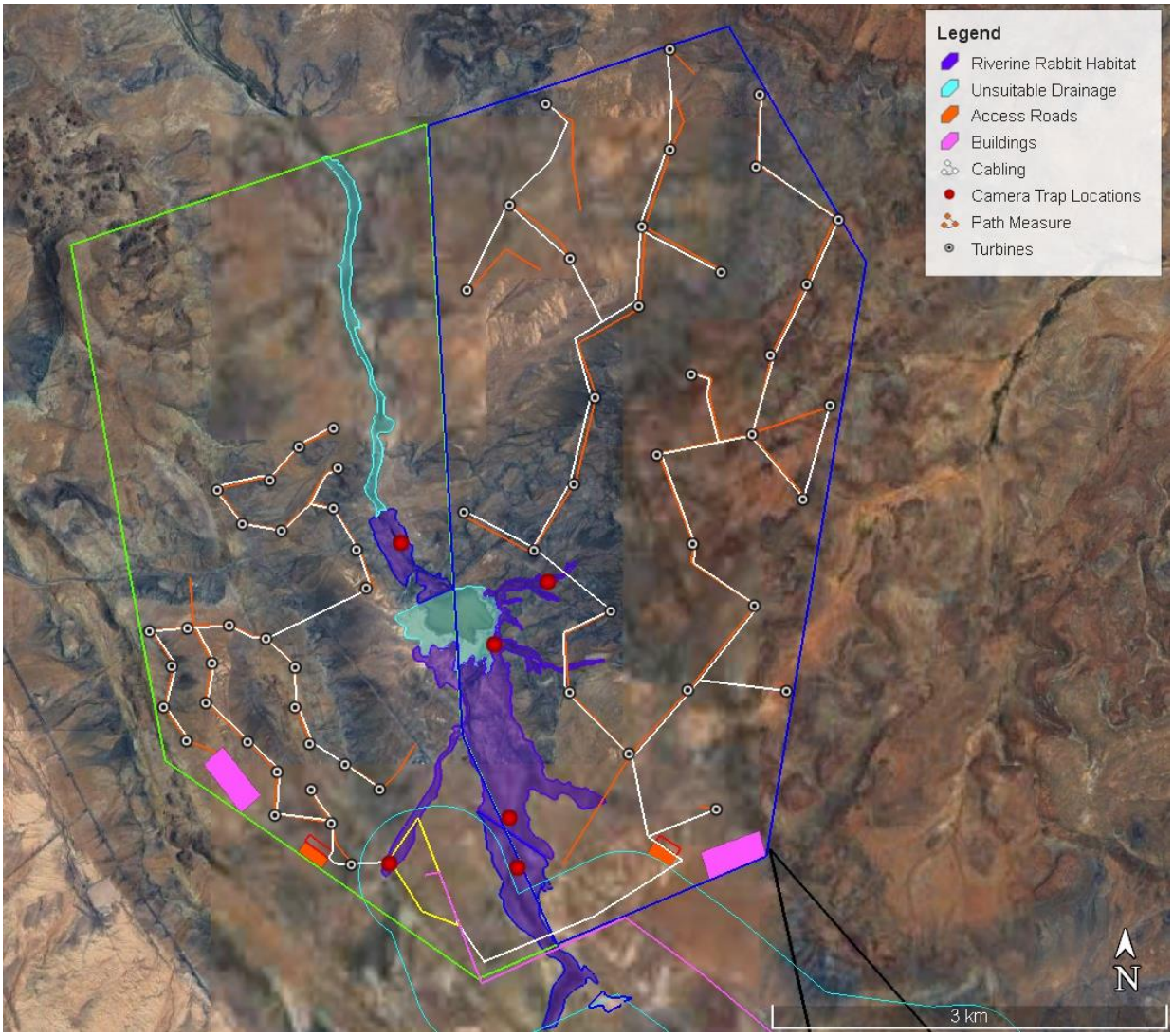

Figure 2. Map showing the location of camera traps (red dots) used in the study as well as the mapping of drainage features and areas identified as potential Riverine Rabbit habitat.

2.3 LIMITATIONS & ASSUMPTIONS

A number of limitations and assumptions are inherent in camera trapping studies generally and with the assessment of rare fauna. These include the following:

- It is not possible to confirm the absence of a species and in this case the Riverine Rabbit with 100% certainty. As such, presence is considered more significant than absence. However, where Riverine Rabbits were observed at a camera trapping location, they tended to be captured relatively shortly after camera deployment and were abundant at such sites relative to other fauna. This suggests that they are relatively common and active within areas of suitable habitat and it is unlikely that they were present at sites where they were not picked up.

- It is possible that not all patches of suitable habitat were occupied at the time of the assessment. Hence the assessment relies on both the presence of suitable habitat as well as confirmed presence of the Riverine Rabbit.
- Although the Riverine Rabbit has a clear habitat preference within the site, it is likely that they disperse between such patches of suitable habitat along the riparian corridors. Hence the areas between such patches are considered to have some significance for this species even if there is no habitat present that might support rabbits.
- It is assumed that if a Riverine Rabbit is picked up within a certain part of a habitat patch, that they are present throughout that patch.

2.4 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. The Site Sensitivity Verification Report is a separate report and is not repeated here.

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 3. It is associated with dense riparian scrub fringing the seasonal rivers of the region (Figure 4, Figure 5). 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). Results of the current camera trapping exercise indicate that they only come out to forage after dark, but may still be active in the early morning after sunrise.

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 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.

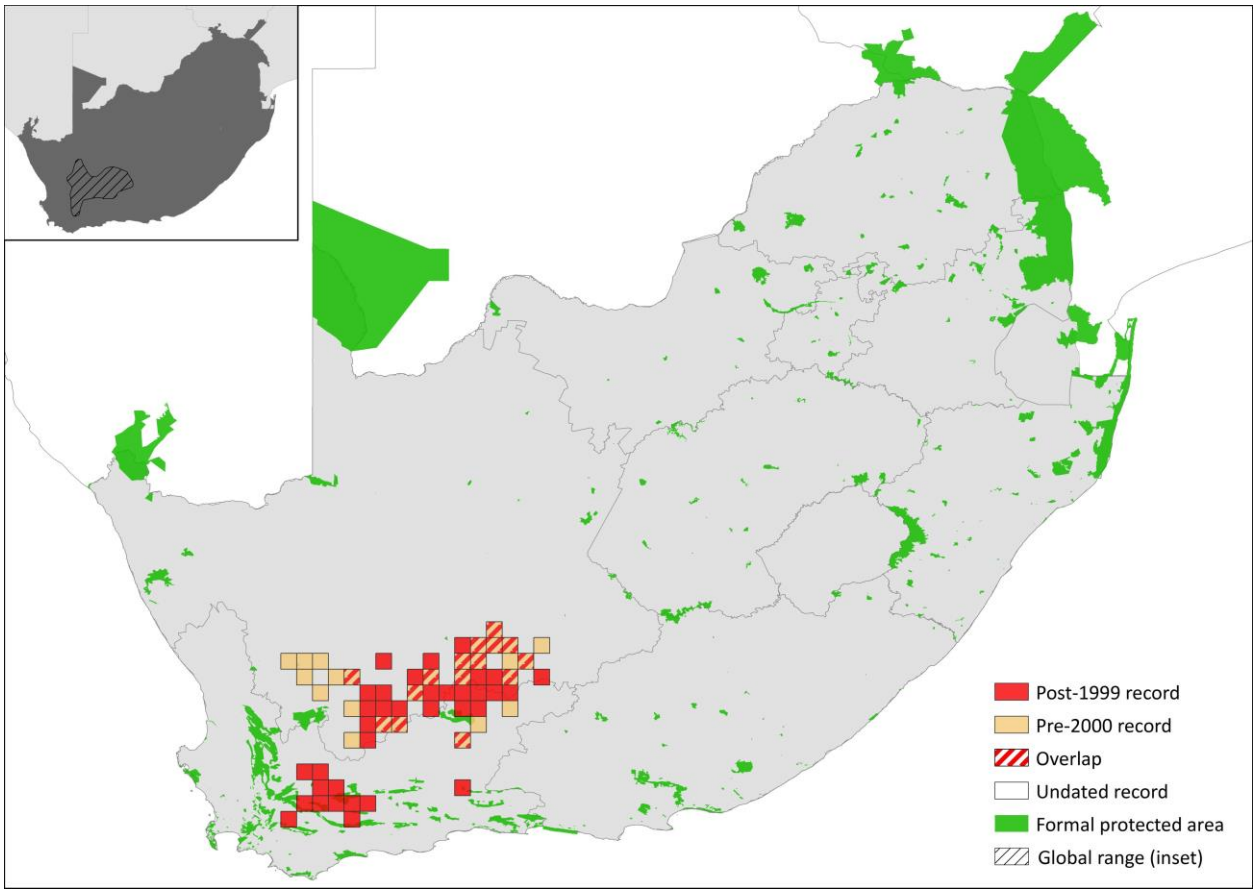

Figure 3. Distribution range for the Riverine Rabbit according to the 2016 IUCN Red-List Assessment conducted by EWT (Collins *et at*. 2016).

Figure 4. Typical drainage feature within the Klipkraal 4 site, with riparian vegetation considered suitable as Riverine Rabbit habitat.

Figure 5. Example of riparian vegetation present within the Klipkraal 4 site, 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 6. The areas of suitable habitat occur along the Sout RIvier as well as some of the other smaller, but well-vegetated drainage features of the site. The total area of mapped potential habitat across the Klipkraal 4 and 5 site is 133 ha. Based on the Riverine Rabbit density reported by Duthie (1989) for an area near Victoria West which can be assumed to similar to the current site, this area would be able to support between 8 and 23 individuals of Riverine Rabbits assuming that all of the identified areas were 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.

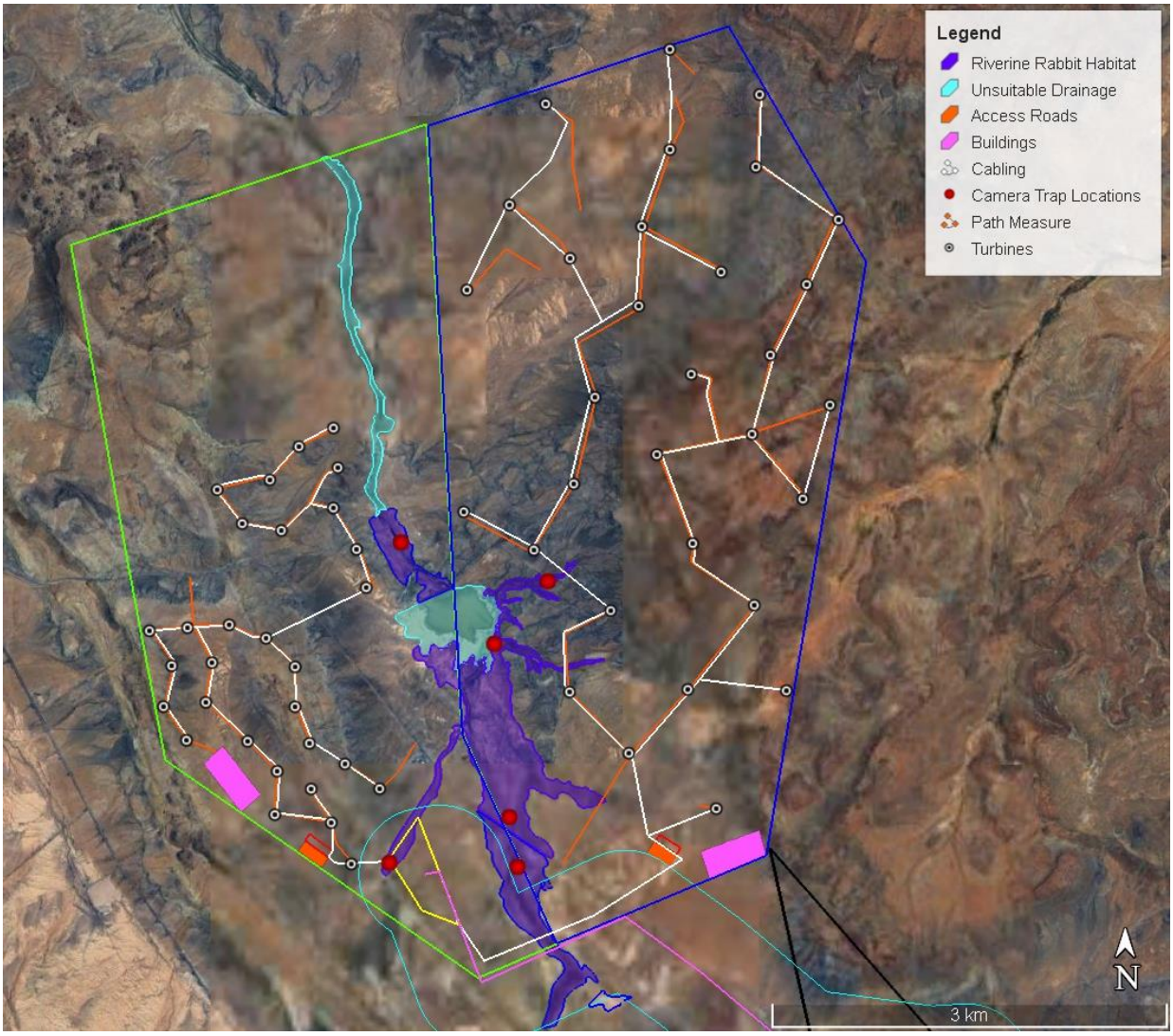

Figure 6. Map of areas within the Klipkraal 4 and 5 cluster considered to represent potentially suitable Riverine Rabbit habitat based on ground-truthed mapping from satellite imagery.

3.3 CAMERA TRAPPING RESULTS

Riverine Rabbits were detected at a single camera location within the Klipraal 4 and 5 area in addition to three positive locations previously recorded at the Klipkraal 1-3 clsuter area (Figure 7, Figure 8), suggesting that the Riverine Rabbit is relatively common in the area within areas of suitable habitat. The activity of Riverine Rabbits at the single camera trap location where this species was recorded within the Klipkraal 4 area was relatively high and 152 captures were recorded from the camera over a period of 20 weeks.

Based on the results of the camera trapping and assuming the patches where rabbits are present are fully occupied, the area occupied by Riverine Rabbits can be estimated as approximately 133 ha and based on the higher density estimate of Duthie (1989) could potentially hold as many as 23 rabbits, but could be as few as 8 individuals. The estimated home range for the Riverine Rabbit is 12 ha and assuming that these are non-overlapping for different individuals, then the 133 ha could support 11 individuals which aligns well with the previous estimate. An alternative and more robust method to estimate population size would be use the minimum number of animals alive, which in the current case can only be assumed to be 1 individual as rabbits were only reocrdedat a single location and it is not possible to differentiate individuals and no more than a single individual was picked up any one time.

As it is unlikely that there is only a single rabbit present within the current study area, the density from the Klipkraal 1-3 study area can be used to estimate the density of rabbits in the area, which was 1 rabbit per 67.5 ha, which is still likely to be an underestimate given the number of observations at some of the camera locations, suggesting that several individuals may have been present. The Area of Occupancy of the Riverine Rabbit has been estimated at 2943 km^2 and assuming that the density across the range is similar to the current study (which is considered highly conservative), that converts to an estimated overall population size of 4360 individuals. This is substantially higher than the estimated population size of 1435 individuals estimated by Duthie *et al.* (1989). The wide discrepancies in the estimate of the overall population size are a consequence of the difficulty in establishing a reliable density estimate across the range of this species and the paucity of information on which such an estimate must be based. However, the known range of the Riverine Rabbit has been significantly expanded since 1989, with the result that the estimate of Duthie is likely an underestimate.

Voucher images from the cameras with Riverine Rabbit observations have been uploaded onto the iNaturalist platform (https://www.inaturalist.org/, Table 2). In terms of the confidence with which images of Riverine Rabbits can be identified and differentiated from other lagomorphs, this is considered to be very high as there are a number of distinctive features of Riverine Rabbits that allow them to be identified even from relatively poor night-time imagery. All of the hares present in the country have black and white tails that are very conspicuous in the photographs as

compared to the rusty tail of the Riverine Rabbit. Although Rock Rabbits have similar-toned tails, they are conspicuously smaller than Riverine Rabbits and the ears of the Rock Rabbits are very short and small compared to the Riverine Rabbit. In frontal shots, the shape of the head and black-line along the jawline are also very distinctive in the Riverine Rabbit. As a result, it is unlikely that many images of Riverine Rabbits were identified as other species and similarly, it is extremely unlikely that any false positives were obtained.

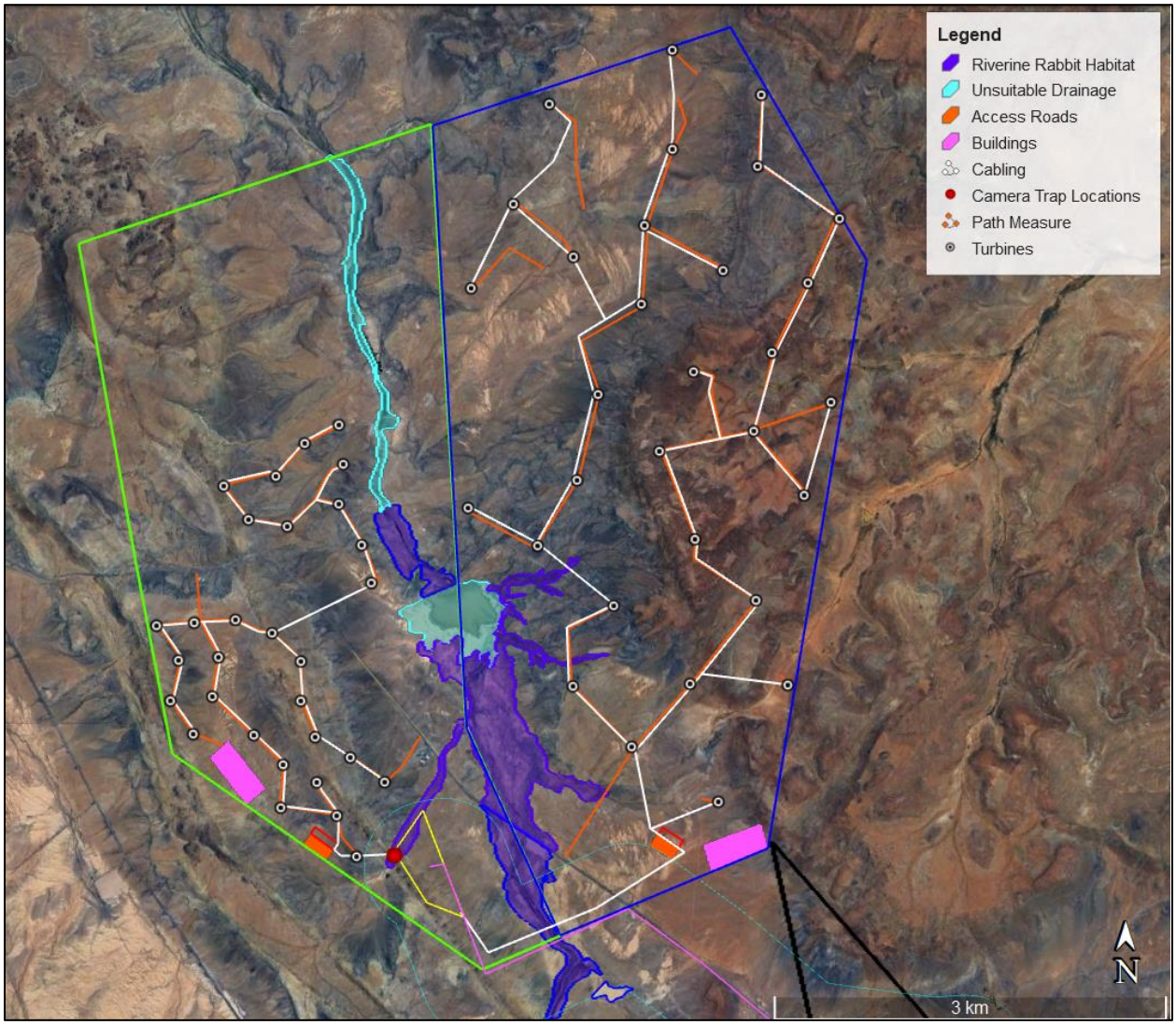

Figure 7. Map showing the location of the camera trap within the Klipkraal 4-5 Cluster site, with confirmed Riverine Rabbit observations.

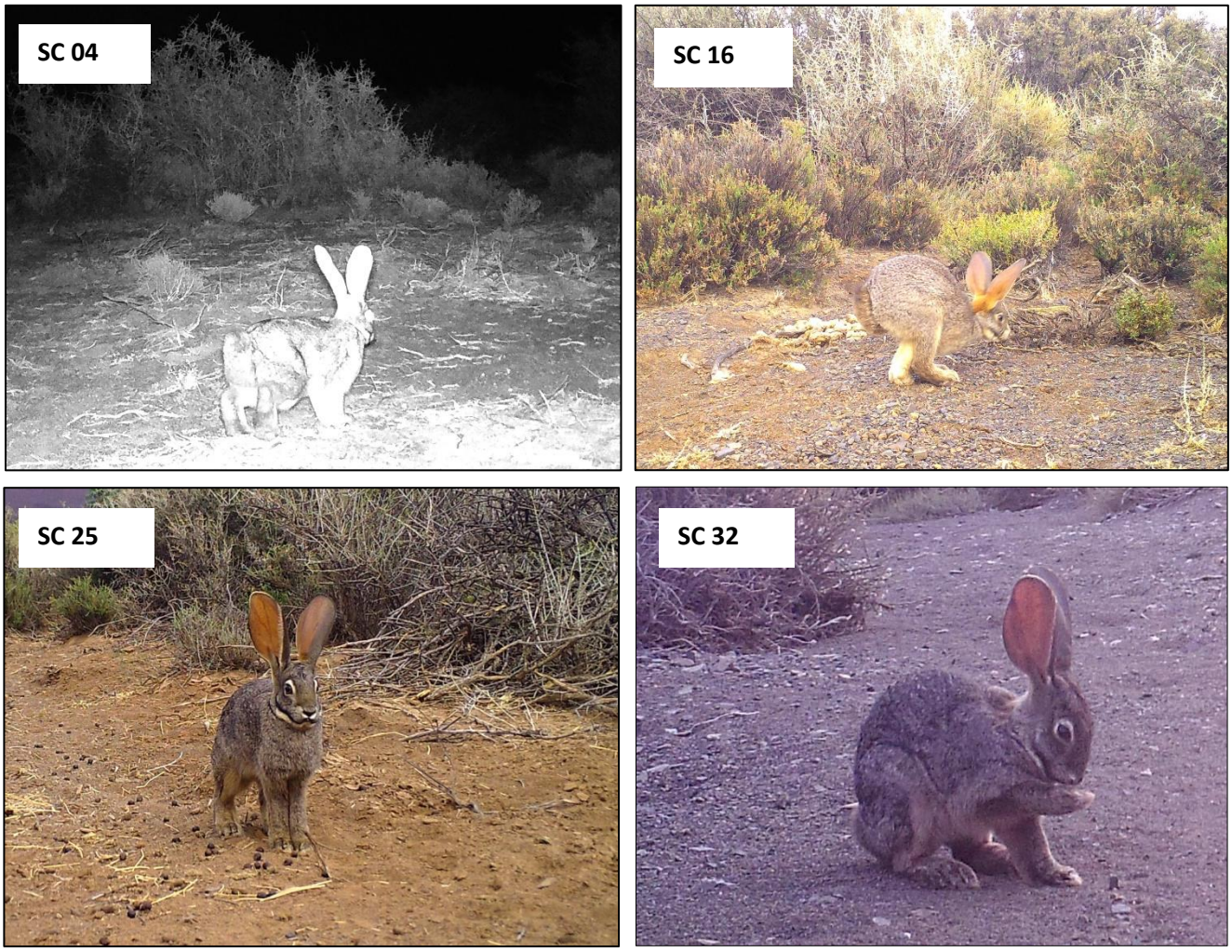

Figure 8. Riverine Rabbit images captured at different localities by camera traps within the wider Klipkraal site. Only SC 32 is located within the Klipraal 4 Wind Farm area.

Table 1. Camera trap numbers and associated iNaturalist observations of Riverine Rabbits observed on the Klipkraal site.

Camera Trap Number	iNaturalist Link	Observations
SC04	https://www.inaturalist.org/observations/148096979	**11**
SC16	https://www.inaturalist.org/observations/148096981	**8**
SC25	https://www.inaturalist.org/observations/148096983	**97**
SC32	https://www.inaturalist.org/observations/173687512	**153**

3.4 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 the site is considered to be **High**. As there is not a large amount

of transformation between the areas of confirmed Riverine Rabbit habitat, 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 site is considered to have a Medium resilience. Thus, the overall **SEI is considered to be High**. In terms of the species assessment guidelines, the implications for the High SEI rating for the site 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*."

3.5 RIVERINE RABBIT SPATIAL ASSESSMENT & DEVELOPMENT BUFFERS

In order to mitigate potential negative impacts on the Riverine Rabbit through avoidance and changes to the layout of the development, the areas of Riverine Rabbit habitat were buffered as follows:

- Areas of identified habitat, regardless of whether rabbits were recorded as present or not, were buffered by 300m. However, the buffer was modified depending on landscape context. In areas where the landscape is flat and open adjacent to the habitat or with areas of seasonally wet vegetation that is not considered to be habitat but may be useful for dispersal and ecosystem function, the buffer was increased up to 1km while in areas where there are large ridges adjacent to the habitat that would act to reduce expose of the habitat to noise and disturbance, the buffer was adaptively reduced down to as little as 200m. However, the majority of the buffer as implemented was set at 300m.
- The riparian corridors between the larger intact habitat patches of habitat are considered to be important for connectivity and dispersal of rabbits between patches. As a result, the river corridor was buffered by 150m to create corridors with a minimum width of 300m.

In terms of development recommendations, the following avoidance was implemented:

- Areas of River Rabbit habitat are considered to represent No-Go areas for turbines.
- Wind farm roads may only traverse areas of Riverine Rabbit habitat along existing major farm access roads.
- Riverine Rabbit habitat buffers are considered to be No-Go areas for turbines.
- Riverine Rabbit habitat buffers are considered to be high sensitivity for wind farm access roads and other permanent infrastructure and subject to individual evaluation.

Under the layout provided for the assessment, there are three turbines located within the Riverine Rabbit habitat buffer and which should be dropped from the layout or moved outside of the buffer area. In addition, the Klipkraal MTS assessment area is located in close proximity to the

confirmed Riverine Rabbit observation and the final location of the MTS should be outside of the buffer.

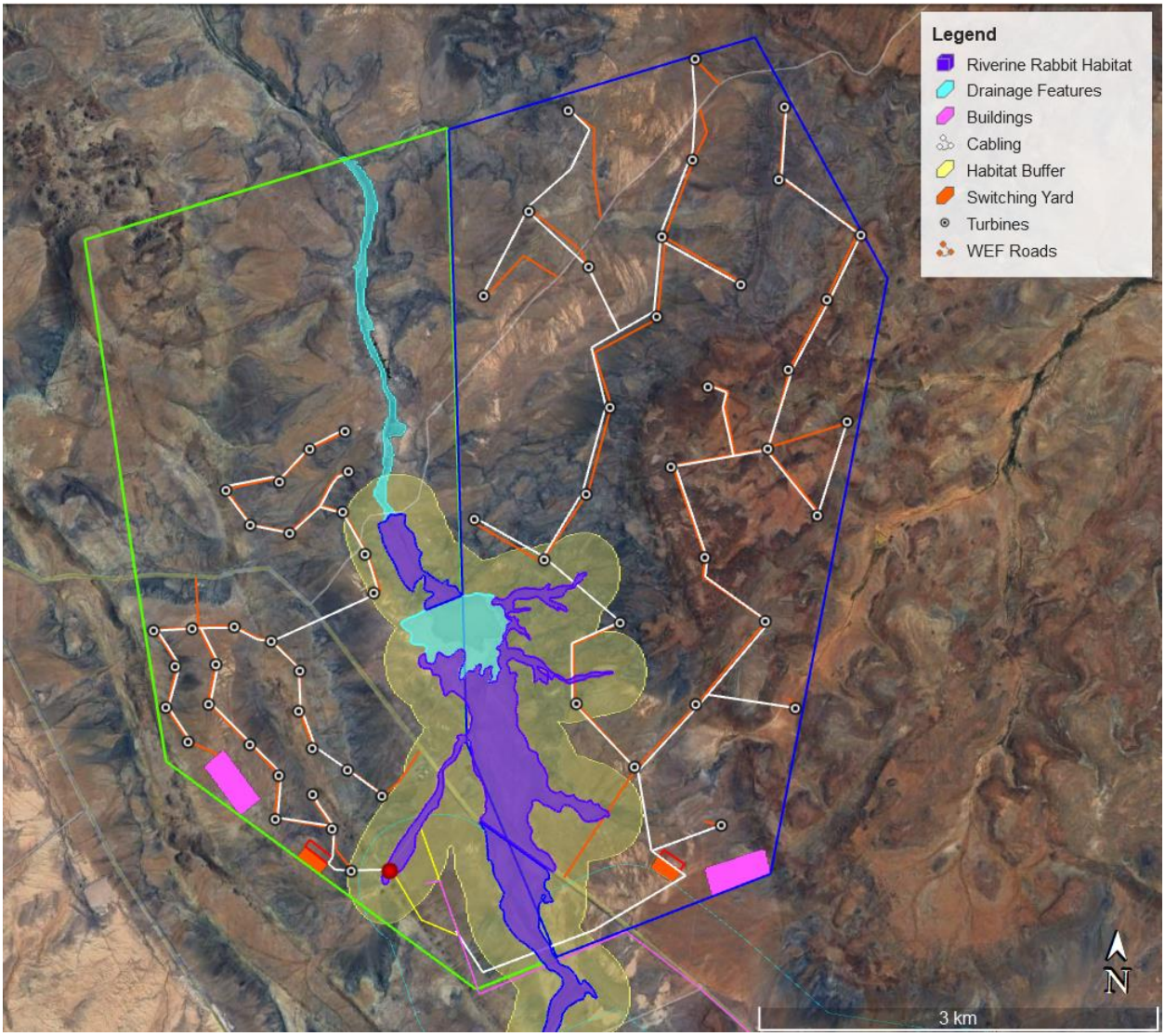

Figure 9. Riverine Rabbit habitat and buffers implemented as part of the study and used to mitigate the impacts of habitat loss and disturbance on Riverine Rabbits and associated habitat on the Klipkraal 4 project area.

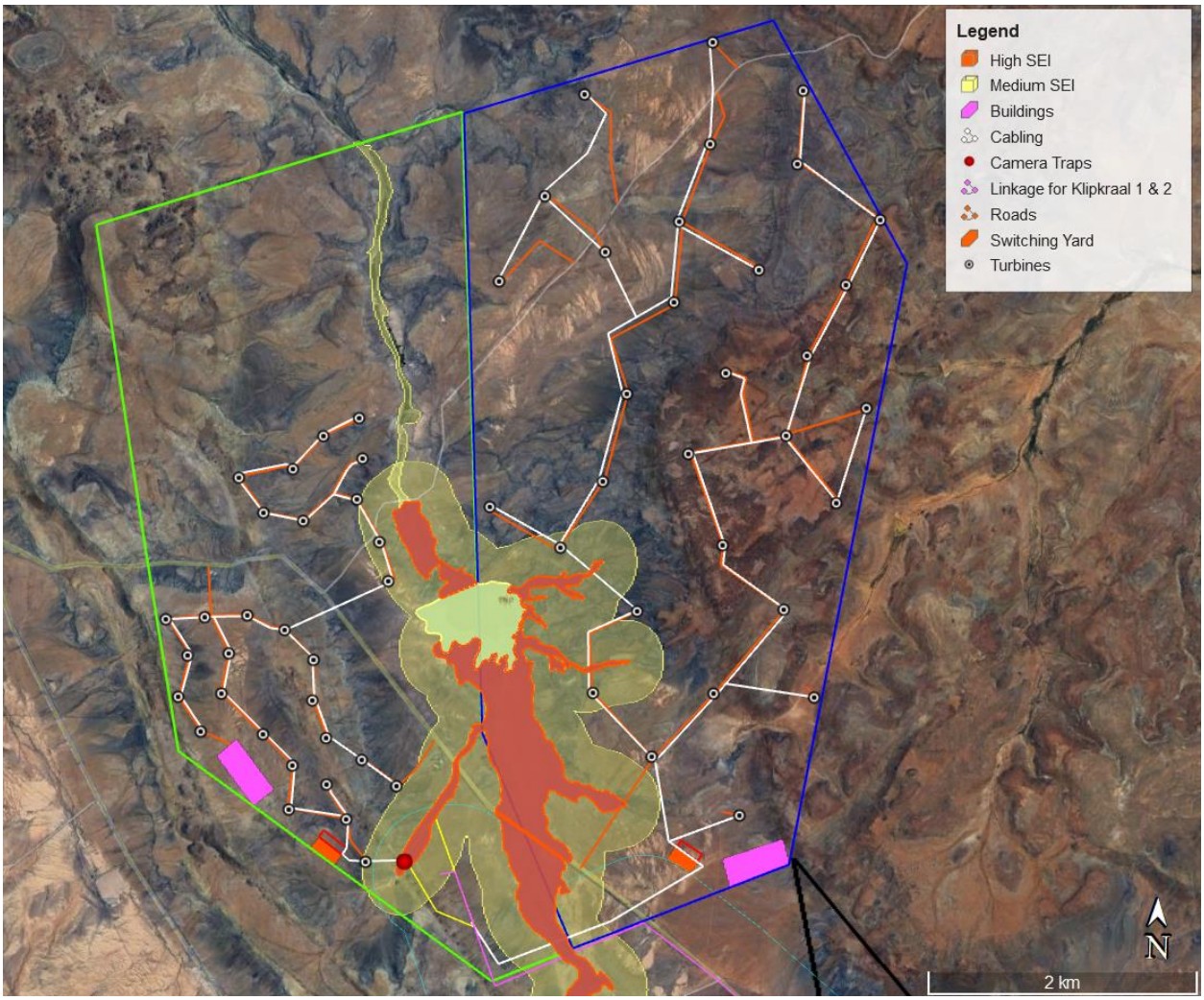

Figure 10. SEI for the Riverine Rabbit on the Klipkraal 4 wind farm site.

4 IMPACTS AND ISSUES IDENTIFICATION

4.1 IDENTIFICATION OF POTENTIAL IMPACTS

The development of the Klipkraal 4 Wind Farm would 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 and a small amount of habitat loss while during the operational phase, direct disturbance would be reduced but there would still be some potential impact from noise and occasional disturbance from operational activities. The following impacts are identified as the major impacts that are likely to be associated with the development of the Klipkraal 4 Wind Farm 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 noise from the turbines would potentially impact the Riverine Rabbit, resulting in local habitat degradation within and adjacent to the site in areas exposed to turbine noise. There may also be occasional disturbance associated with wind farm operational and maintenance activities as well as increased traffic within, to and from the site which may increase vehicle-related mortality.

Impact 3. Cumulative impact on the Riverine Rabbit

Although a single development may have an acceptable impact on the Riverine Rabbit, the construction of multiple developments in an area may generate cumulative negative impacts on habitat loss, disturbance and other cumulative impacts that together threaten the persistence of this species in the affected area.

5 ASSESSMENT OF IMPACTS ON RIVERINE RABBIT– KLIPKRAAL 4 WIND FARM

An assessment of the likely significance of the impacts identified above is made below for the impacts of the Klipkraal 4 Wind Farm on Riverine Rabbits.

5.1 CONSTRUCTION PHASE IMPACTS ON THE RIVERINE RABBIT

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I/M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I/M	TOTAL	STATUS (+ OR -)	S
Construction Phase																				
Construction Phase impact on the Riverine Rabbit	Impacts on Riverine Rabbit as a result of construction phase activities, including vehicle collisions, disturbance and habitat loss.	2	3	2	2	2	3	33	-	Medium	**See Below.**	2	2	2	2	2	2	20	-	Low
Recommended Mitigation Measures	1) 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. 2) 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. 3) 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. 4) Where any new roads, cabling and/or overhead lines 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. 5) There should be a monitoring programme for Riverine Rabbit roadkill during construction that should be used to inform any additional mitigation and avoidance that should be implemented. 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. 6) Ensure that riparian areas near to the development footprint are clearly demarcated as no-go areas with appropriate signage and barriers.																			

5.2 IMPACTS ON RIVERINE RABBIT DURING OPERATION

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I/M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I/M	TOTAL	STATUS (+ OR -)	S
Operational Phase																				
Operational Phase impact on the Riverine Rabbit	There would potentially be impact on Riverine Rabbits at the site during operation due to operational activities (vehicles/disturbance) as well as turbine noise.	2	2	2	2	3	3	33	-	Medium	**See Below.**	2	2	2	2	3	2	22	-	Low
Recommended Mitigation Measures	1) A Riverine Rabbit Monitoring Programme should be implemented at the site to evaluate the post-construction impact of the development on the Riverine Rabbit as well as other key fauna at the site. As there is some potential for noise and disturbance-related impacts on Riverine Rabbits, the development presents a clear opportunity to evaluate the degree to which wind farms are compatible with the maintenance and conservation of Riverine Rabbit populations within their boundaries. The monitoring programme should be conducted with input from EWT and should include preconstruction monitoring to establish a reliable baseline of Riverine Rabbit abundance and distribution at the site. This should be followed by matched post-construction monitoring to evaluate the potential negative impacts on the Riverine Rabbit population. The exact duration and frequency of monitoring would need to be determined based on the number of cameras to be used and the desired precision and statistical power to be obtained. 2) The monitoring should include a feedback mechanism to use these findings to improve future wind energy development in Riverine Rabbit areas should be developed. 3) All incidents involving Riverine Rabbits should be documented and reported to the local EWT field office in Loxton. If Rabbits are killed, the carcases should be collected and provided to EWT for the collection of DNA and other samples.																			

5.3 DECOMMISSIONING PHASE IMPACTS ON RIVERINE RABBITS

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I/M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I/M	TOTAL	STATUS (+ OR -)	S
Decomissioning Phase																				
Decommissioning Phase impact on the Riverine Rabbit	Impacts on Riverine Rabbit as a result of decommissioning phase activities, including vehicle collisions, disturbance.	2	2	2	2	2	2	20	-	Low	**See Below.**	2	2	2	2	2	1	10	-	Low
Recommended Mitigation Measures	1) 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. 2) 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. 3) 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. 4) Where any roads, cabling and/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. 5) 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. 6) Ensure that riparian areas near to the development footprint are clearly demarcated as no-go areas with appropriate signage and barriers.																			

5.4 CUMULATIVE IMPACTS ON THE RIVERINE RABBIT

ENVIRONMENTAL PARAMETER		ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION		ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION	

	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	E	P	R	L	D	I/M	TOTAL	STATUS (+ OR -)	S	RECOMMENDED MITIGATION MEASURES	E	P	R	L	D	I/M	TOTAL	STATUS (+ OR -)	S
Decomissioning Phase																				
Cumulative impact on the Riverine Rabbit	Cumulative impacts on the Riverine Rabbit as a result of habitat loss, disturbance and increased predation and poaching.	3	2	2	2	3	3	36	-	Medium	**See Below.**	2	2	2	2	3	2	22	-	Low
Recommended Mitigation Measures	1) Avoidance of areas of mapped optimal Riverine Rabbit during construction and maintenance activities. 2) Adherence to the speed limits of 40km/h for light vehicles and 30km/h for heavy vehicles when off of public roads. 3) Erosion and alien vegetation management on site, with annual surveys and annual implementation of clearing and erosion remediation.																			

6 CONCLUSION & RECOMMENDATIONS

The Riverine Rabbit was detected at a single locality within the Klipkraal 4 and 5 cluster area, located within the Klipkraal 4 project area. This is in addition to the three sites that the Riverine Rabbit was observed at within the Klipkraal 1-3 cluster project area, which lies immediates south of the current project area. Together these sightings suggest that the Riverine Rabbit is relatively common within the wider project area within areas of suitable habitat. Since there was only a single detection location within the Klipraal 4 project area, a single individual would be the minimum number of individuals confirmed present, but based on published estimates of population density, the areas of confirmed habitat within the site could potentially hold between 8 and 23 individuals. Assuming a similar population density across the range, within the published area of occupancy, the site is likely to hold less than 0.05% of the overall population of Riverine Rabbits.

Due to the presence of the Riverine Rabbit at the site and the condition and extent of habitat, the areas of habitat within the site are considered to have a High Site Ecological Importance (SEI). The areas of identified suitable habitat have been buffered from turbines by up to 300m depending on the landscape context and the potential for impact due to turbine noise and flicker. Under the assessed layout there are three turbines within the habitat buffer and which should be relocated outside of the buffer area. With the implementation of the above avoidance as well as the other recommended mitigation measures, the overall long-term impact of the development on Riverine Rabbits and their associated habitat is likely to be acceptable and would not be likely to compromise the local or regional population of this species.

Since the impacts of wind energy development on Riverine Rabbits are not known, it is recommended that a Riverine Rabbit Monitoring Programme should be implemented at the site to evaluate the post-construction impact of the development on the Riverine Rabbit as well as other key fauna at the site. As there is some potential for noise and disturbance-related impacts on Riverine Rabbits, the development presents a clear opportunity to evaluate the degree to which wind farms are compatible with the maintenance and conservation of Riverine Rabbit populations within their boundaries. The details of the monitoring programme should be developed in collaboration with the EWT Dryland Programme and should at minimum include the following components and outcomes:

- Preconstruction monitoring to establish a reliable baseline of Riverine Rabbit abundance and distribution at the site.
- Matched post-construction monitoring to evaluate the potential negative impacts on the Riverine Rabbit population.
- It is estimated that each phase of the above monitoring would need to last approximately 1 year (not necessarily continuously, but in order to capture different seasons and different associated activity levels). The monitoring must be conducted in a manner which allows for reliable effect sizes and statistically-backed inferences to be made.

- Funding to conduct the above monitoring and a feedback mechanism to improve future wind energy development in areas with Riverine Rabbits (i.e., input on guidelines for wind energy development in Riverine Rabbit areas). The running cost of such monitoring is estimated at approximately R250 000 per year. This does not include an initial outlay for any cameras and associated equipment that may be required. Assuming that 50 cameras are deemed sufficient, then this would amount to approximately R150 000 at current camera trap prices for a typical camera trap suitable for this application. In addition, quantitative monitoring requires advanced statistical analyses and it may be necessary to reimburse a specialist in this regard.

Impact Statement

Although Riverine Rabbits and associated habitat have been confirmed present within the Klipkraal 4 site, habitat loss within these areas would be low after the implementation of the recommended mitigation and avoidance. The buffers implemented around the identified areas of suitable habitat are seen to be sufficient to minimise long-term noise and disturbance impacts on this species. As a result, long-term impacts associated with the Klipkraal 4 Wind Farm on the Riverine Rabbit are likely to be low. Consequently, the development of the Klipkraal 4 Wind Farm is considered acceptable with the implementation of the suggested avoidance and monitoring as indicated.

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