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Terrestrial Animal Species Compliance Statement

Compiled for: Cape Environmental Assessment Practitioners (Pty) Ltd (Cape EAPrac)

Project name: Dwarsbergstrand, Portion of Erf 720, Great Brak River, Western Cape Province

Applicant: Kaapland Onderwys Trust

25 November 2022

[Updated Report of 07 November 2022**]**

DECLARATION OF INDEPENDENCE

In terms of Chapter 5 of the National Environmental Management Act of 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014, specialists involved in Environment Assessment Processes must declare their independence and provide their contact details, relevant experience, and a curriculum vitae.

I, Jonathan F. Colville, as the appointed independent specialists, do hereby declare that I am financially and otherwise independent of the client and their EAP, and that all opinions expressed in this document are my own and based on my scientific and professional knowledge, and available information.

Jonathan F. Colville

ABRIDGED CURRICULUM VITAE

Jonathan Colville
Qualifications: **PhD (Zoology):** University of Cape Town, 2009; **Postdoctoral Research Fellowship:** South African National Biodiversity Institute, 2009-2013.

SACNASP Registration No: 134759 (Ecological Science (Professional Natural Scientist)).

Experience: I have over fourteen years post-PhD experience in the fields of terrestrial ecology, including investigating the spatial patterns of South Africa's animal and plant diversity, with a particular focus on invertebrates. Between 2009 and 2019, I was involved with the South African National Biodiversity Institute's (SANBI) Biodiversity, Research, Assessment and Monitoring Division (BRAM) undertaking ecological research on South Africa's insect and plant diversity. Since 2020 I have been working as a specialist faunal consultant for EIAs and conservation projects. *See copy of my CV attached as Appendix-2 to this report.

CONDITIONS PERTAINING TO THIS REPORT

The content of this report is based on my best scientific and professional knowledge, and available information. I reserve the right to modify the report in any way deemed fit should new, relevant, or previously unavailable or undisclosed information become known to me from on-going research or further work in this field, or pertaining to this investigation, and will inform Cape EAPrac accordingly. This report must not be altered or added to without the prior written consent of myself. This also refers to electronic copies of the report, which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must refer to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

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1. INTRODUCTION

Cape EAPrac has been engaged by Kaapland Onderwys Trust to undertake a Basic Assessment for an proposed Dwarsbergstrand development on Erf 720 (Great Brak River, Western Cape Province).

Cape EAPrac utilised the National Web based Environmental Screening Tool (https://screening.environment.gov.za/screeningtool/) to generate an online site sensitivity report. The screening tool uses faunal species data provided by the South African National Biodiversity Institute (SANBI).

The Screening Tool identified the development footprint of the above project as being rated "High" sensitivity for two invertebrate, one bird, and one mammal species of Conservation Concern (SCC), with possible suitable habitat for:

- Invertebrate: Yellow-winged Agile Grasshopper (*Aneuryphymus montanus*): Medium Sensitivity
- Invertebrate: Eastern Red Russet (*Aloeides thyra orientis*): Medium Sensitivity
- Bird: Knysna Warbler (*Bradypterus sylvaticus*): High Sensitivity
- Mammal: Sensitive species 8: Medium Sensitivity

2. TERMS OF REFERENCE

I was appointed by Cape EAPrac on 26 September 2022 to conduct a site sensitivity verification, in two phases, a desktop study and a preliminary site visit to assess the possibility of suitable available habitat for the faunal SCC at the project site. Based on the information obtained from these two phases, either a Terrestrial Animal Species Compliance Statement would then be issued, or a Terrestrial Animal Species Specialist Assessment would subsequently be required, as stipulated in the Government Gazette, No. 43855 (Published in Government Notice No. 1150) of 30 October 2020: "Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal Species".

1. Carry out a desktop study to determine if any of the faunal SCC have been recorded at or near the project area and to ascertain the habitat requirements of the SCC.
2. Conduct a preliminary survey of the project area to assess the physical and biological characteristics of the site with regards to habitat suitability for the faunal SCC and identify any sensitive areas, buffer zones, no-go areas, and possible alternatives.
3. Prepare a report detailing the findings of the desktop study and site visit, with conclusions and the issuing of a Terrestrial Animal Species Compliance Statement or a recommendation that a Terrestrial Animal Species Specialist Assessment would be required.

3. METHODOLOGY

3.1 DESKTOP STUDY

- Distributional records for invertebrate SCC were extracted from digitized databases of several South African museums (e.g., Iziko Museum of South Africa, Ditsong National Museum of Natural History, South African National Collections of Insects). Online resources, such as the IUCN Red List of Threatened Species (https://www.iucnredlist.org/), the Orthoptera Species File

Online (http://orthoptera.speciesfile.org/HomePage/Orthoptera/HomePage.aspx), LepiMAP (https://vmus.adu.org.za/), and iNaturalist (https://www.inaturalist.org/) were also consulted for information on SCC's geographic distributions and habitat requirements.

- The Virtual Mueum of African Mammlas (MammalMap; https://vmus.adu.org.za/) was consulted for distributional records for South Africa's mammals.
- Distributional records from the Southern African Bird Atlas Project (SABAP2 data (http://sabap2.birdmap.africa/)) for the bird SCC were examined. Online resources, such as the IUCN Red List of Threatened Species (https://www.iucnredlist.org/) were also consulted for information on the bird SCC's geographic distributions and habitat requirements.
- Furthermore, Dr Callan Cohen (Director of Birding Africa) was consulted as an avifaunal specialist. Dr Cohen has extensive knowledge of Cape birds and is a recognised international expert on African birds. He has a PhD in Ornithology from the University of Cape Town where he is a Research Associate of the FitzPatrick Institute of African Ornithology. He has co-authored two books on South African birds and contributed to five others, including the Red Data Book of Birds of South Africa, Lesotho and Swaziland (Taylor *et al.*, 2015). He has over 30 years of experience of bird field surveys
- Published information on all faunal SCC were also investigated to further assess their distribution range, ecology, habitat, and any life history requirements.

3.2 FIELD SITE VISIT

- The project area (Figure 1) was surveyed on foot on the 25 and 29 September 2022 to assess faunal habitat sensitivity and quality, in terms of the type and amount of natural vegetation remaining. The extent of disturbance that the project area has experienced, in terms of changes to its vegetation and physical properties (e.g. soil) was also considered.
- Andrew Morton (Chairman of the Lepidopterists Society of the Western Cape) participated in the site inspection on the 29 September 2022 and in searching and assessing habitat for butterfly SCC.
- Season: Spring.
- Duration: ~ 6 hrs.
- Areas at and around selected points were investigated across the project area and photographed (Figures 4 - 13), the surrounding habitat was characterised, and the likelihood of any of the SCC being present was assessed.
- In additional to visual searching, sweep netting (SANBI, 2020) using an insect net was undertaken at selected points for the grasshopper SCC.
- Visual searching using binoculars and sound recordings of bird calls were used to detect the bird SCC.
- Seasonal Relevance:
    - For the invertebrate SCC spring to summer is an ideal time for detection of these species (Brown, 1960a; Hochkirch *et al.*, 2018; Mecenero *et al.*, 2013; SANBI), 2020)
    - Late September is an appropriate time for field detection of the bird SCC as it overlaps with the breeding season of this species and when adults are calling (August and November).

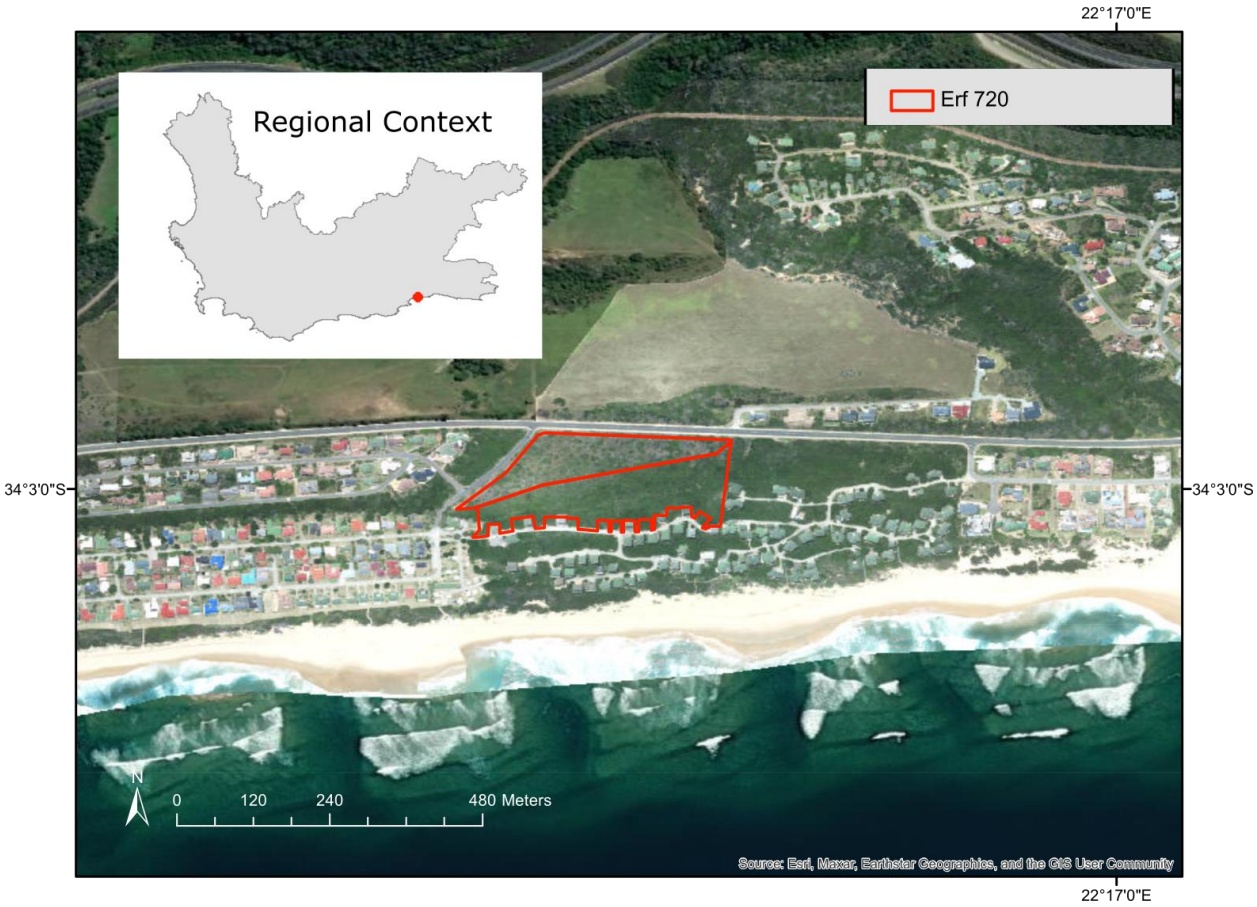

Figure 1: The proposed Dwarsbergstrand development on Erf 720, Great Brak River, Western Cape Province.

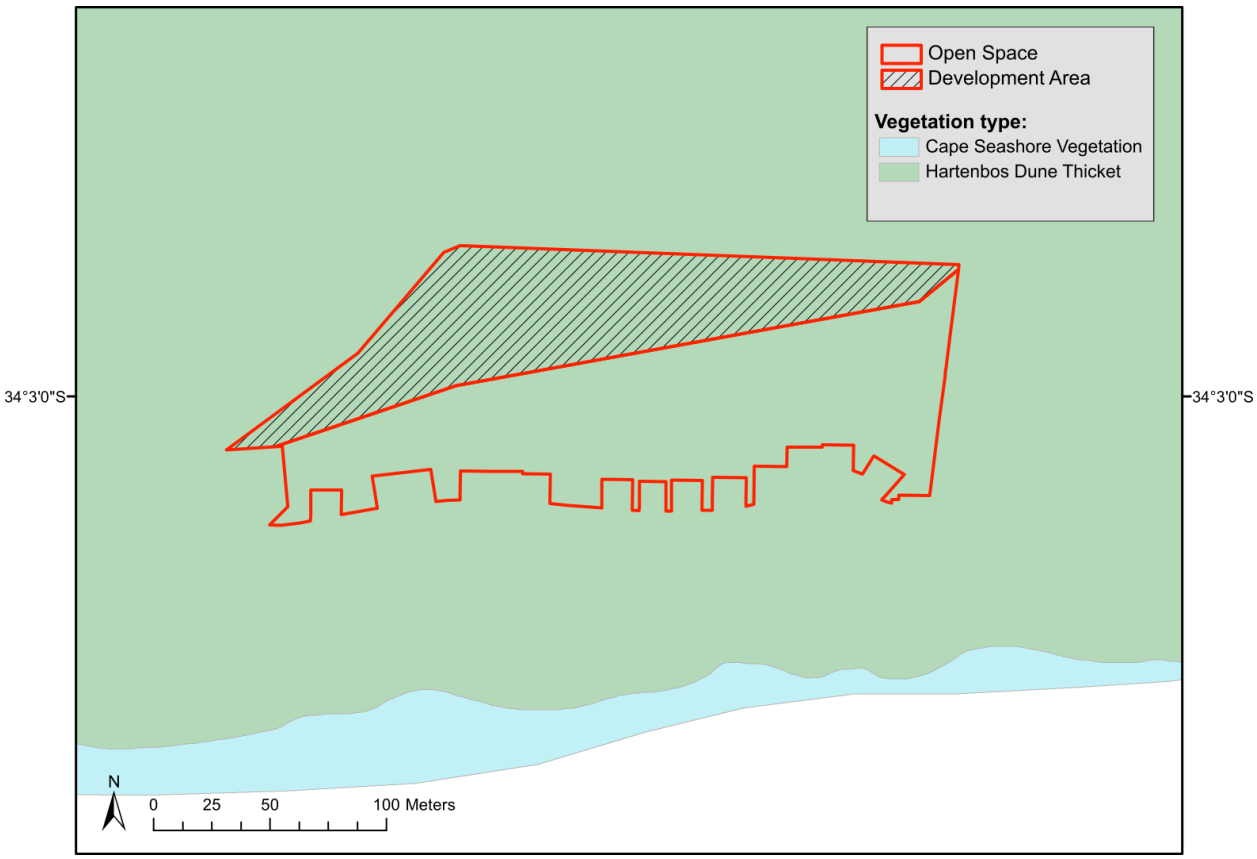

Figure 2: The proposed development area (hatched) in relation to vegetation types (SANBI, 2018; Skowno *et al.*, 2019).

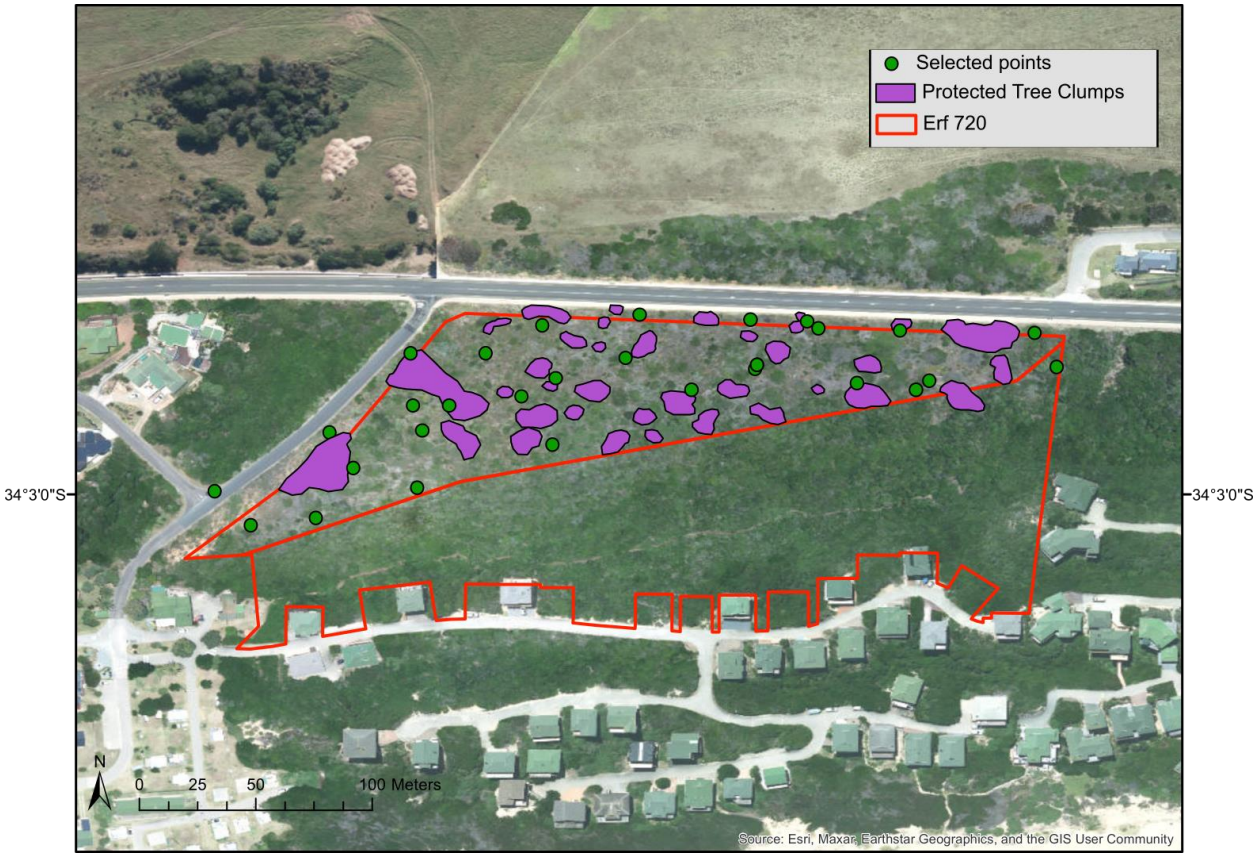

Figure 3: Selected points (green dots) that were investigated and photographed across the project area on 25 & 29 September 2022. Protected tree clumps (pink) mapped across the development area.

4. RESULTS

4.1 ASSUMPTIONS AND LIMITATIONS

- It is assumed that all third-party information used (e.g. GIS data and species historical records) was correct at the time of generating this report.
- A site visit was undertaken during spring (late September) on a warm and sunny day. Undertaking a site visit in spring is an ideal time to detect most of the listed faunal SCC at the project site.

4.2. DESKTOP STUDY

The main vegetation type of the project area following SANBI (2018) and Skowno *et al.* (2019) is:

- Hartenbos Dune Thicket (Least Concern (LC); Approximately 13% of this vegetation type is severely degraded for the Western Cape Province).

4.2.1 SPECIES OF CONSERVATION CONCERN (SCC)

Invertebrates:

Aneuryphymus montanus (Brown, 1960) Yellow-winged Agile Grasshopper

- This species of grasshopper is endemic to South Africa and has an IUCN Red List Category and Criteria of **Vulnerable** B2ab (iii,v) (Hochkirch *et al.*, 2018).
- Within South Africa, the species has a broad distribution occurring across mountainous habitats of the "Cape Region" from the north-western winter-rainfall areas near Clanwilliam, eastwards until just before East London (Brown, 1960b). The species appears to be associated with several fynbos vegetation types (e.g., Leipoldtville Sand Fynbos, Kogelberg Sandstone Fynbos) and "south-facing cool slopes" (Kinvig, 2005).
- It has a large estimated extent of occurrence of 172463km^2 and its estimated geographic range overlaps the project area (Bazelet and Naskrecki, 2014).
- The species has not been historically recorded from near the project area nor other coastal habitats; the closest known record is approximately 80kms north for a collection record inland from South Swartberg Sandstone Fynbos.

Aloeides thyra orientis (Pringle, 1994) (Eastern Red Russet)

- This species of butterfly is endemic to South Africa and has an IUCN Red List Category and Criteria of **Endangered** B1ab(ii,iii,iv,v) (Mecenero *et al.*, 2013, 2020).
- The species has a known distribution from around ten localities within south coastal areas (Witsand and Mossel Bay to Knysna) (Mecenero *et al.*, 2013).
- The species appears to be associated with several fynbos vegetation types, mostly coastal, but it has not been recorded from Hartenbos Dune Thicket.
- No published information is known for larval food plants or ant associations.
- It has an estimated extent of occurrence of >500km^2 across several highly fragmented populations (Mecenero *et al.*, 2013).
- The species has not been historically recorded from the project area; the closest known record is approximately 50km away from a locality in Southern Cape Dune Fynbos vegetation.

Avifauna:

Bradypterus sylvaticus (Sundevall, 1860) Knysna Warbler

- This species of warbler is endemic to South Africa occurring patchily along the southern coast from Cape Town to Mbumbazi Nature Reserve, KwaZulu-Natal.
- It has an IUCN Red List Category and Criteria of **Vulnerable** (B1ab(i,ii,iii,iv,v); C2a(i)) (BirdLife International, 2022; Taylor *et al.*, 2015).
- It creeps around in thick undergrowth and tangles in forest, forest edges, and coastal thickets.
- The project area is in the core area of its distribution and the species is extremely likely to occur on the site.
- When a forest becomes overshaded by too many trees, this species will vacate the habitat as it prefers dense bush, which cannot grow in low light conditions. In recent years it has resorted to living in woodlands densely invaded by alien plants.

Mammals:

Sensitive Species 8

- This species of mammal is endemic to Africa and has an IUCN Red List Category and Criteria of **Least Concern** and a South African regional red list of **Vulnerable** B2ab(ii, ii, v) + C1a(i). [**Please Note: Citations for published literature related to this sensitive species have been withheld to protect its identity and can be requested from the author of this report if needed].
- Within South Africa, the species appears to be declining due to forest habitat loss from urban development, mining and increasing poaching and hunting with domestic dogs.
- The estimated area of occupancy (AOO) ranges from 1,415–2,858 km^2, but this SCC has very short dispersal distances (< 1km) between forest patches; habitat fragmentation is therefore a key consideration for this SCC.
- They occur predominantly within scarp and coastal forests, thickets and dense coastal bush, but can occupy modified habitats and areas of mixed land use. They forage in open areas in forest glades but require dense underbrush to rest or take cover.
- Historical records extracted from virtual museums, and more recent records from citizen science online platforms, are known for this SCC from close to the project site (e.g. a 24 January 2019 camera trap record from approximately 5kms west of the project site).

4.3 FIELD SITE VISIT

- On both site visits the weather was sunny and warm and conducive to faunal activity.
- All areas across the project development were investigated and chosen to provide representative photographs (Figures 4 -13).
- Sweep netting (SANBI, 2020) was undertaken at selected points for the Orthoptera SCC.
- Within the project area, visual searching using binoculars and sound recordings of bird calls were used to detect bird SCC.
- Areas at and around selected points were investigated across the project area and photographed (Figures 4 - 13).
- Habitat characteristics and likelihood of faunal SCC being found around each picture site is provided below.
- Overview of locations of these photographs. Note that photos towards the edge of the project area are taken looking into the project area, and thus the areas represented are far more than simply the footprint of the photographer.
- Seasonal Relevance:
    - Potentially all the SCC can be active at the project site at the time of year the survey was undertaken.

Figure 4: Butterfly specialist standing on the north-western corner of the Dwarsbergstrand proposed development. [GPS: S34.04923 E22.27651].

Figure 5: Looking down the northern boundary of the development area. The area close to the road verge shows signs of disturbance, most likely from the construction of Morrison Road. [GPS: S34.04923 E22.27651].

Figure 6: The vegetation of the development area consists of areas dense bushes and trees that are suitable habitat for Knysna Warbler and Sensitive species 8. [GPS: S34,0494 E22,27596].

Figure 7: Areas of clearing of alien plants are found within the development area. Alien trees are still present across the development area, including Rooikrans (*Acacia cyclops*) and scattered Manatoka (*Myoporum tenuifolium*). [GPS: S34,04954 E22,27625].

Figure 8: Small antelope dung midden seen within the development area, suggesting possible suitable habitat for Sensitive species 8. This suggests that it is connected to other areas of natural vegetation and highlights the potential impact of the development on faunal corridors. [GPS: S34.04943 E22.27654].

Figure 9: Several well-established indigenous tree species are scattered in clumps within the project area. These would offer nesting sites, shelter, and food (such as fruit from milkwoods (*Sideroxylon inerme*) for birds and possibly Sensitive species 8). Clumps of indigenous trees should be considered an important ecological feature of the project area and where possible protected. [GPS: S34,04951 E22,27698].

Figure 9: Looking down off the development area into the densely-vegetated ‘ravine’ of Erf 720. This habitat is suitable for the Knysna Warbler and Sensitive species 8. The area is connected to a broader network of vegetation on the east (broad band) and the west (very narrow band). It is important that the narrow band on the west is not impacted by the proposed timber staircase (see Figure 14). [GPS: S34.04943 E22.27654]. [** See Appendix 1].

Figure 10: The area close to where the proposed access road will enter. [GPS: S34.04921 E22.27602].

Figure 11: The area just north to where the proposed access road will enter. This area is better suited as the entry point as it will bisect two large tree clumps and it appears to be somewhat disturbed by alien tress (Rooikrans and Manatoka). [GPS: S34.04961 E22.27502]. [** See Appendix 1].

Figure 12: The area above the proposed access road on the steep bank where the road will enter. This area is disturbed with alien grass and the bank vegetation appears to have been landscaped at some stage. [GPS: S34.04961 E22.27502].

Figure 13: A patch of densely-vegetated habitat to the immediate west of Erf 720, which extends for ~ 500m westwards further connecting to other areas of natural/semi-natural vegetation. This suggests that Erf 720 is part of a relatively well-connected network of areas of natural vegetation that will need to be maintained. [GPS: S34.049835 E22.274337].

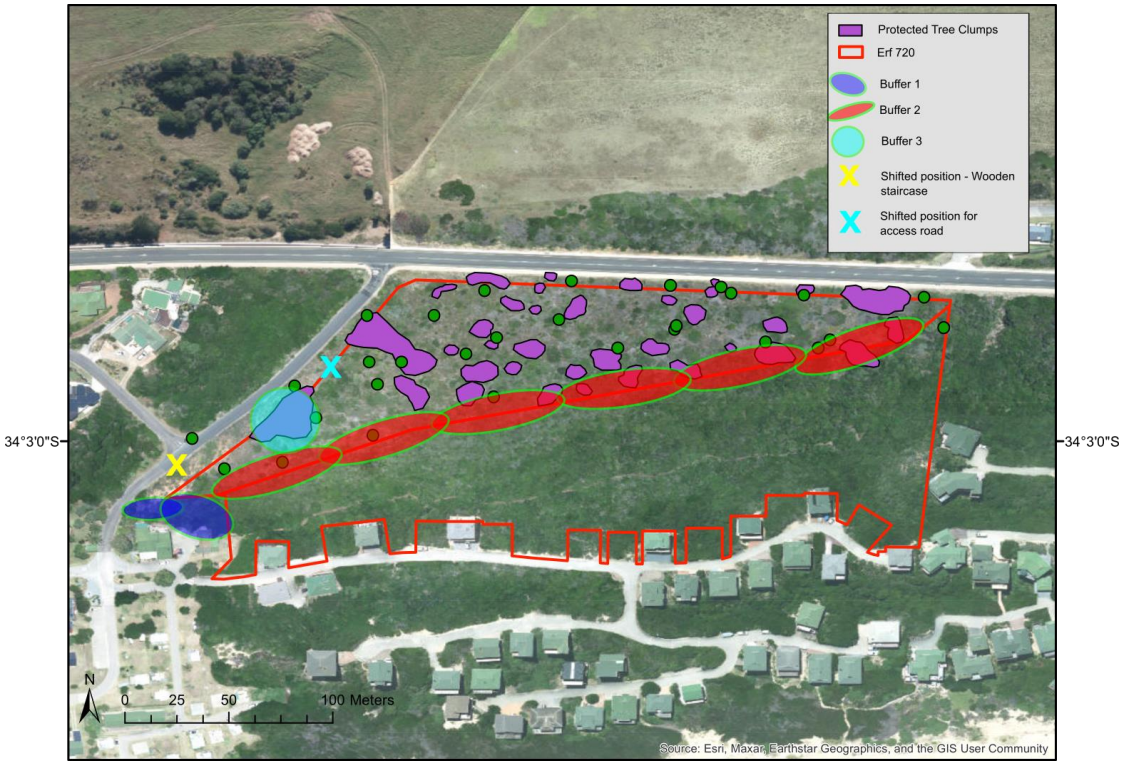

Figure 14: High sensitive areas and buffers for the proposed Dwarsbergstrand development. [**See Appendix 1].

5. CONCLUSIONS

- This Terrestrial Animal Species Compliance Statement is applicable to the project area shown in Figures 1-3, and as described in the documentation provided to me by Cape EAPrac.
- Based on the available information for the faunal SCC's distribution, their known habitat preferences, and the relatively small overall footprint of the proposed development, it is considered that the project will be of overall **Low sensitivity** for the four faunal SCC assessed.
- The proposed development should not have any overall impact on the four faunal SCC.
- The butterfly SCC *Aloeides thyra orientis* was not observed at the project site. The vegetation at Dwarswegstrand is dune thicket and it is unlikely that this butterfly will be present as its preferred habitat is coastal fynbos.
- The habitat of the project site is considered marginal for the Yellow-winged Agile Grasshopper (*Aneuryphymus montanus*). This wide-spread species appears most associated with fynbos vegetation.
- There is a high likelihood that the Knysna Warbler (*Bradypterus sylvaticus*) is found at the project site, both in the upper area (dense bushes and tree clumps) of proposed development and the lower densely-vegetated 'ravine' of Erf 720. Considering that the development is relatively low-density with a relatively small footprint, and that it appears as if areas of natural vegetation

will be retained within the development area, it is considered that the impact on this species will be low. Additionally, the densely-vegetated lower areas of Erf 702 fall outside of the development. However, further research should potentially focus on Knysna Warbler persistence adjacent to houses and the effect that introduced *Rattus* species might have on nest predation and the continued survival of this species in these areas,

- There is a high likelihood that Sensitive species 8 is found at the project site, both in the upper area of proposed development area (possible dung evidence) and the lower densely-vegetated 'ravine' of Erf 720. It is considered that the impact on this species will be low as the lower areas of Erf 702 falls outside of the development and would offer preferred habitat for this SCC.
- Within the proposed areas, areas of **high sensitivity** (Figure 14) are associated with:
    - The ecotone boundary between the upper development area and the lower 'ravine' area: The 10m proposed buffer line (buffer 2 red circles Figure 14) shown on the site development plan (P190070/C/100) is strongly supported to prevent undue disturbance for faunal elements that move between the upper areas and the lower 'ravine' areas.
    - Related to this, the planned 1.8m high beta fence is a concern, as this will effectively cut-off access on the southern boundary for Sensitive species 8, and other medium-small mammals, to the upper areas of natural vegetation. It is recommended that the southern boundary of the project area should not be fenced. The fence on the northern boundary along Morrison Road and western boundary along H.C. Botha Street should not pose an issue for faunal movement.
    - The proposed wooden staircase: The current position of the staircase is of concern as it will be near the western tail-end of natural vegetation that extends from the lower areas of Erf 720 (Buffer 1 dark blue circles Figure 14). This area of natural vegetation connects to a large corridor of natural vegetation on the other side of H.C. Botha Street (Figure 13). Maintaining this linkage to a broader network of landscape connectivity is essential. It is suggested that the wooden staircase be moved ~ 45m northwards (yellow X on Figure 14) to reduce possible negative impacts from the construction of the staircase and human disturbance through human activity on the staircase.
    - The position of proposed access road from H.C. Botha Street falls over a protected tree clump (buffer 3 light blue circle Figure 14). These indigenous tree clumps found across the development area should be retained where possible as they offer habitat and resources for faunal SCC. It is proposed the the access road be moved a short distance north, to bisect the area between two tree clumps (see also Figure 12).
    - If the above concerns of the beta fence, wooden staircase, and tree clumps cannot be accommodated, then a faunal impact assessment will be required for the high sensitive areas. If they can be accommodated, then this compliance statement of low sensitivity will hold.
- **These concerns related to the high sensitivity areas have been addressed by the new layout plan (Appendix 1), and the new layout complies with the above mentioned recommendations.

1. ACKNOWLEDGMENTS

Andrew Morton (Chairman of the Western Cape Lepidopterist Society) assisted with site surveying on 29 September 2022 and provided valuable input concerning butterfly taxa of conservation importance associated with the project site. Dave McDonald (Bergwind Botanical Surveys & Tours CC) is thanked for showing JFC the project site on 25 September 2022. CapeNature is thanked for collecting permits: CN44-87-20545 and CN44-59-13497.

2. REFERENCES

Bazelet, C.S. and Naskrecki, P. (2014), *Conocephalus Peringueyi. The IUCN Red List of Threatened Species 2014: E.T20633594A43266622*, available at: https://dx.doi.org/10.2305/IUCN.UK.2014-1.RLTS.T20633594A43266622.en.

BirdLife International. (2022), *Species Factsheet: Bradypterus Sylvaticus. BirdLife International (2022) IUCN Red List for Birds. Downloaded from Http://Www.Birdlife.Org on 31/10/2022*.

Brown, H.D. (1960a), "New Grasshoppers (Acridoidea) from the Great Karroo and the South Eastern Cape Province", *Journal of the Entomological Society of Southern Africa*, Vol. 23 No. 1, pp. 126–143.

Brown, H.D. (1960b), "New Grasshoppers (Acridoidea) from the Great Karroo and the South Eastern Cape Province", *Journal of the Entomological Society of South Africa*, Vol. 23, pp. 126–143.

Hochkirch, A., Bazelet, C. and Danielczak, A. (2018), *Aneuryphymus Montanus. The IUCN Red List of Threatened Species 2018: E.T116114515A116116590.*, available at: dx.doi.org/10.2305/IUCN.UK.2018-1.RLTS.T116114515A116116590.en.

Kinvig, R.G. (2005), *Biotic Indicators of Grassland Condition in Kwazulu-Natal, with Management Recommendations*, University of KwaZulu-Natal.

Mecenero, S., Ball, J.B., Edge, D.A., Hamer, M.L., Henning, G.A., Krüger, M., Pringle, E.L., *et al.* (2013), *Conservation Assessment of Butterflies of South Africa, Lesotho and Swaziland: Red List and Atlas*, edited by Mecenero, S., Ball, J.B., Edge, D.A., Hamer, M.L., Henning, G.A., Krüger, M., Pringle, E.L., et al., Saftronics (Pty) Ltd., Johannesburg & Animal Demography Unit, Cape Town.

Mecenero, S., Edge, D.A., Trust, B.B., Staude, H.S. and Coetzer, B. (2020), "Outcomes of the Southern African Lepidoptera Conservation Assessment Outcomes of the Southern African Lepidoptera Conservation Assessment (SALCA)", *Metamorphosis*, Vol. 31 No. December, pp. 1–160.

SANBI. (2018), "South African National Biodiversity Institute (2006- 2018)", in Mucina, L., Rutherford, M.C. and Powrie, L.W. (Ed.), *The Vegetation Map of South Africa, Lesotho and Swaziland*, Version 20., available at: http://bgis.sanbi.org/SpatialDataset/Detail/18.

Skowno, A.L., Raimondo, D.C., Poole, C.J., Fizzotti, B. and Slingsby, J.A. (2019), *South African National Biodiversity Assessment 2018 Technical Report Volume 1: Terrestrial Realm. South African National Biodiversity Institute, Pretoria*.

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. V*.

Taylor, M.R., Peacock, F. and Wanless, R.M. (2015), *The 2015 Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland*.

APPENDIX – 1


ACCOMMODATION NUMBERS
(8 x) Duette Units: 1, 2 / 3, 4 / 11, 12 / 14,15 / 16, 17 / 19, 20 / 21, 22 / 24,25.
(10 x) 2 Bedroom Units: 5, 6, 7, 8, 9, 10, 13, 18, 23, 26.
PROPOSED CONFERENCE ROOM AND LAPA BUILDING
PROPOSED 1.8m HIGH BETA FENCE ON BOUNDARY
MORRISON ROAD
PROPOSED POOL AND ABLUTION FACILITIES
PROPOSED 1.8m HIGH BETA FENCE ON BOUNDARY
PROPOSED RUBBISH ENCLOSURE AND SHELTER
PROPOSED GATE HOUSE
PROPOSED ACCESS ONTO HC BOTHA STREET
H.C. BOTHA STREET
CONNECTION TO EXISTING MUNICIPAL STORMWATER RETICULATION
EXISTING MUNICIPAL STORMWATER RETICULATION
EXISTING WATER RETICULATION CONNECTION TO MUNICIPAL WATER LINE
EXISTING MAIN WATER LINE
PORTION OF ERF 720
6m FIRE BREAK
PROPOSED NEW SEWER PACKAGE PLANT
32mm HDPE WATER PIPELINE
160mm uPVC SEWER PIPE
ALLOW 10m BUFFER LINE FROM TOP OF BANK
1st PHASE CONSTRUCTION (One unit to be disabled friendly)
PROPOSED 1.8m HIGH BETA FENCE
PROPOSED 1.5m PAVED WALKWAY
ERF 21
(KLOOFSTRAAT)
ELEMENT Consulting Engineers
A FIFTH DIMENSION TO ENGINEERING
KAAPLAND ONDERWYS TRUST
PROPOSED DWARSWEGSTRAND DEVELOPMENT
FINAL VERSION
SITE DEVELOPMENT PLAN & SERVICES LAYOUT
ORIGINAL SIZE A1
1903141
1903141/C/100

APPENDIX – 2
CURRICULUM VITAE – JONATHAN F. COLVILLE

EDUCATION

PhD (Zoology): University of Cape Town, 2009. Thesis title: "*Understanding the evolutionary radiation of the megadiverse monkey beetle fauna (Scarabaeidae: Hopliini) of South Africa*".

Postdoctoral research fellowship: South African National Biodiversity Institute, 2009-2010.

PRIOR EMPLOYMENT

National Research Foundation Research Career Advancement Fellow: South African National Biodiversity Institute (2014-2019).

Researcher, South African National Biodiversity Institute, GEF/UNEP/FAO Global Pollination Project – South Africa (2010-2014).

PUBLICATIONS

Books edited:

- Allsopp, N., **Colville, J.F.**, Verboom, G.T. (2014). *Fynbos: Ecology, Evolution, and Conservation of a Megadiverse Region* (16 chapters; pp 1-377). Oxford University Press.

Book chapters:

- Forest F., **Colville J.F.**, Cowling R.M. (2018). Evolutionary diversity patterns in the Cape Flora of South Africa. In: *Phylogenetic Diversity: Applications and challenges in biodiversity science*. R. Scherson, D. Faith (Eds), Springer International Publishing.
- Lebuhn, G., Connor, E.F., Brand, M., **Colville, J.F.**, Keday, D., Resham, B.T., Muo, K., Ravindra, K.J. (2015). Monitoring pollinators around the world. In: *Pollination services to agriculture*. B. Gemmill-Herren (Ed), Routledge.
- **Colville, J.F.**, Potts, A.J., Bradshaw, P.L., Measey, G.J., Snijman, D., Picker, M.D., Procheș, Ș., Bowie, R.C.K., Manning, J.C. (2014). Floristic and faunal Cape biochoria: do they exist? In: *Fynbos: Ecology, Evolution, and Conservation of a Megadiverse Region*. N. Allsopp, J.F. Colville, G.A. Verboom (Eds), Oxford University Press.
- Lach, L., Picker, M.D., **Colville, J.F.**, Allsopp, M.H., and Griffiths, C.L. (2002). Alien invertebrate animals in South Africa. In: *Biological invasions: Economic and environmental costs of alien plant, animal, and microbe species*. D. Pimentel (Ed), CRC Press, London.

Journal articles:

- Barraclough, D.A., and **Colville, J.F**. (2022). The first species of Nemestrinidae (Diptera) endemic to Madagascar: A remarkable new species of *Atriadops* Wandolleck, 1897. *Zootaxa*. 5196 (1): 145–150.
- Dombrow, H., **Colville, J.F**., Bowie, R.C.K. (2022). Review of the genus *Amblymelanoplia* Dombrow, 2002 (Coleoptera: Scarabaeidae: Melolonthinae: Hopliini) with the description of ninety-three new species from South Africa and observations on its biogeography and phylogeny. *Zootaxa*. 5163 (1): 1-278.
- Melin, A., and **Colville, J.F**. (2022). Description of the male of *Rediviva steineri* Kuhlmann 2012 (Hymenoptera: Melittidae), an endemic oil-collecting bee species from South Africa. *African Entomology*. 30: e11178.

- Allen-Perkins, A., Magrach, A., Dainese, M., Garibaldi, L., … **Colville, J.F**., et al. (2022). CropPol: A dynamic, open, and global database on crop pollination. *Ecology*. 103, 3, e3614.
- Dorchin, N.; van Munster, S.; Klak, C.; Bowie, R.C.K.; **Colville, J.F**. (2022). Hidden diversity – A new speciose gall midge genus (Diptera: Cecidomyiidae) associated with succulent Aizoaceae in South Africa. *Insects*. 13, 75. https://doi.org/10.3390/insects13010075
- Cohen, C., Liltved, W.R., **Colville, J.F**., Shuttleworth, A., Weissflog, J., Svatos, A., Bytebier, B., Johnson, S.D. (2021). Sexual deception of a beetle pollinator through floral mimicry. *Current Biology*. 31: 1–8.
- Krenn, H.W., Karolyi, F., Lampert, P., Melin, A., **Colville, J.F**. (2021). Nectar uptake of a long-proboscid *Prosoeca* fly (Nemestrinidae) – Proboscis morphology and flower shape. *Insects*. 12(371): 1–13.
- McLeod, L., and **Colville, J.F.** (2021). Observations on unusual feeding and mating behaviour of a monkey beetle genus *Amblymelanoplia* Dombrow (Coleoptera: Scarabaeidae: Hopliini). *African Entomology*. 29(1): 301–306.
- **Colville, J.F**., Beale, C.M., Forest, F., Altwegg, R., Huntley, B., Cowling, R.M. (2020). Plant species richness, turnover and evolutionary diversity track gradients of stability and ecological opportunity in a megadiversity centre. *Proceedings of the National Academy of Sciences* (*PNAS)*. 117 (33): 20027–20037.
- Dombrow, H. & **Colville, J.F.** (2020). Review of the genus *Beckhoplia* Dombrow with the description of fifteen new species from South Africa and observations on its biogeography (Coleoptera: Scarabaeidae: Melolonthinae: Hopliini). *Zootaxa*. 4823(1): 1-64.
- Melin, A., Altwegg, R., Manning, J.C., and **Colville, J.F.** (2020). Allometric relationships shape foreleg evolution of long-legged oil bees (Melittidae: *Rediviva*). *Evolution*. https://doi.org/10.1111/evo.14144.
- Melin, A. & **Colville, J.F**. (2020). A nesting aggregation of *Rediviva intermixta* (Melittinae: Melittidae) with males sleeping together in nests (Namaqualand, South Africa). *The Journal of the Kansas Entomological Society*. 92 (3): 561–568.
- Melin, A., **Colville, J.F**., Duckworth, G.D.; Altwegg, R.; Slabbert, R.; Midgley, J.J.; Rouget, M.; Donaldson, J.S. (2020). Diversity of pollen sources used by managed honeybees in variegated landscapes. *Journal of Apicultural Research*. Doi10.1080\00218839.2020.1750757.
- Melin, A., Krenn, H.W., Manning, J.C., **Colville, J.F.** (2019). The allometry of proboscis length in Melittidae (Hymenoptera: Apoidae) and an estimate of their foraging distance using museum collections. *PLoS ONE*. 14(6): e0217839.
- Melin, A. & **Colville, J.F.** (2019). A review of 250 years of Southern African bee taxonomy and exploration (Hymenoptera: Apoidea: Anthophila). *Transactions of the Royal Society of South Africa*. 74:1, 86-96. [**Featured on Cover Page**]
- Rink, A.R., Altwegg, R., Edwards, S., Bowie, R.C.K., **Colville, J.F.** (2019). Contest dynamics and assessment strategies in combatant monkey beetles (Scarabaeidae: Hopliini). *Behavioural Ecology*. 40: 713–723.
- Barraclough, D., **Colville, J.F.**, Karolyi, F., Krenn, H.W. (2018). A striking new species of *Prosoeca* Schiner, 1867 (Diptera: Nemestrinidae): An important pollinator from the Bokkeveld Plateau, Northern Cape Province, South Africa. *Zootaxa* 4497: 411–421.
- **Colville, J.F.**, Picker, M.D., Cowling, R.M. (2018). Feeding ecology and sexual dimorphism in a speciose flower beetle clade (Hopliini: Scarabaeidae). *PeerJ*: 6:e4632.
- Melin, A., Mathieu, R., **Colville, J.F**., Midgley, J.J., Donaldson, J.S. (2018). Quantifying and evaluating distributed floral resources for managed honeybee pollination using an expanded concept of supporting ecosystem services. *PeerJ*: e5654.
- Cowling, R.M, Bradshaw, P.L., **Colville, J.F.**, Forest, F. (2017). Levyns' Law: Explaining the evolution of a remarkable longitudinal gradient in Cape plant diversity. *Transactions of the Royal Society of South Africa*. 72: 184-201.
- Treurnicht M., **Colville J.F.**, Joppa L.N., Huyser O., Manning J.C. (2017) Counting complete? Finalising the plant inventory of a global biodiversity hotspot. *PeerJ:* 5:e2984.
- Janion-Scheepers, C., Measey, G.J., Braschler, B., Chown, S.L., Coetzee, L., **Colville, J.F.**, Dames, J., Davies, A.B., *et al*. (2016). Soil biota in a megadiverse country: Current knowledge and future research directions in South Africa. *Pedobiologia*. 59: 129-174.
- Karolyi F., Hansal T., Krenn H.W., **Colville J.F.** (2016). Comparative morphology of the mouthparts of the megadiverse South African monkey beetles (Scarabaeidae: Hopliini): Feeding adaptations and guild structure. *PeerJ*: 4:e1597.

- Bradshaw, P.L., **Colville, J.F.**, Linder, H.P. (2015). Optimising regionalisation techniques: Identifying centres of endemism in the extraordinarily endemic-rich Cape Floristic Region. *PLoS ONE*. 10: e0132538.
- Cowling, R.M., Potts, A.J., Bradshaw, P.L., **Colville, J.F.**, Arianoutsou, M., Ferrier, S., Forest, F., Fyllas, N.M., Hopper, S.D., Ojeda, F., Procheș, Ș., Smith, R.J., Rundel, P.W., Vassilakis, E., Zutta, B.R. (2015). Variation in plant diversity in Mediterranean-climate ecosystems: The role of climatic and topographical stability. *Journal of Biogeography*. 42: 552-564.
- Kleijn, D., Winfree, R., Bartomeus, I., Carvalheiro, L.G., Henry, M., Isaacs, R., Klein, A-M., Kremen, C., M'Gonigle, L.K., Rader, R., Ricketts, T., Williams, N.M, Adamson, N-L., Ascher, J.S., Baldi, A., Batary, P., Benjamin, F., Biesmeijer, J.C., Blitzer, E.J., Bommarco, R., Brand, M.R., Bretagnolle, V., Button, L., Cariveau, D.P., Chifflet, R., **Colville, J.F.**, Danforth, B.N., Elle, E., Garratt, M.P.D., Herzog, F., Holzschuh, A., Howlett, B.G., Jauker, F., Jha, S., Knop, E., Krewenka, K.M., Le Feon, V., Mandelik, Y., May, E.M., Park, M.G., Pisanty, G., Reemer, M., Riedinger, V., Rollin, O., Rundlof, M., Sardinas, H.S., Scheper, J., Sciligo, A.R., Smith, H.G., Steffan-Dewenter, I., Thorp, R., Tscharntke, T., Verhulst, J., Viana, B.F., Vaissiere, B.E., Veldtman, R., Westphal, C., Potts, S.G. (2015). Delivery of crop pollination services is an insufficient argument for wild pollinator conservation. *Nature Communications*. 6: 7414**.**
- Manning, J.C., Goldblatt, P., **Colville, J.F.**, Cupidoa, C.N. (2015). Hopliine beetle pollination in annual *Wahlenbergia* species (Campanulaceae) from western South Africa, and the new species *W. melanops*. *South African Journal of Botany*. 100: 58-62.
- Mecenero, S., Altwegg, R., **Colville, J.F.**, Beale, C.M. (2015). Roles of spatial scale and rarity on the relationship between butterfly species richness and human density in South Africa. *PLoS ONE*. 10: e0124327.
- Forest, F., Goldblatt, P., Manning, J.C., Baker, D., **Colville, J.F.**, Devey, D.S., Jose, S., Kaye, M., Buerki, S. (2014). Pollinator shifts as trigger of speciation in painted petal irises (*Lapeirousia*: Iridaceae). *Annals of Botany*. 113: 357-71.
- Karolyi, F., **Colville, J.F.**, Handschuh, S., Metscher, B.D., Krenn, H.W. (2014). One proboscis, two tasks: Adaptations to blood-feeding and nectar-extracting in long-proboscid horse flies (Tabanidae, *Philoliche*). *Arthropod Structure & Development*. 43: 403-413.
- Karolyi, F., Morawetz, L., **Colville, J.F.**, Handschuh, S., Metscher, B.D., Krenn, H.D. (2013). Time management and nectar flow: Flower handling and suction feeding in long-proboscid flies (Nemestrinidae: *Prosoeca*). *Naturwissenschaften*. 100: 1083-1093. [**Featured on Cover Page**]
- Ryan, P.G., **Colville, J.F.**, Picker, M.D. (2013). Juvenile African Pipit feeding on monkey beetles. *Ornithological Observations*. 4: 6-8.
- Karolyi, F., Szucsich, N.U., **Colville, J.F.**, Krenn, H.W. (2012). Adaptations for nectar-feeding in the mouthparts of long-proboscid flies (Nemestrinidae: *Prosoeca*). *Biological Journal of the Linnean Society*. 107: 414-424.
- Picker, M.D., **Colville, J.F.**, Burrows, M. (2012). A cockroach that jumps. *Biology Letters*. 8: 390-392.
- **Colville, J.F.** (2009). Understanding the evolutionary radiation of the mega-diverse monkey beetle fauna (Scarabaeidae: Hopliini) of South Africa. *Frontiers in Biogeography*. 1: 24-29.
- Bohn, H., Picker, M.D., Klaus-Dieter, K. & **Colville, J.F.** (2010). A jumping cockroach from South Africa, *Saltoblattella montistabularis*, gen. nov., spec. nov. (Blattodea: Blattellidae). *Arthropod Systematics & Phylogeny*. 68: 53-69. **[Featured as a "Top 10 New Species discovery" by the International Institute for Species Exploration**].
- **Colville, J.F.**, Picker, M.D., Cowling, R.M. (2002). Species turnover of monkey-beetles (Scarabaeidae: Hopliini) along environmental and disturbance gradients in the Namaqualand region of the Succulent Karoo, South Africa. *Biodiversity and Conservation*. 11: 243–264.
- Picker, M.D., **Colville, J.F.**, van Noort, S. (2002). Mantophasmatodea now in South Africa. *Science*. 297: 1475.

Technical reports:

- **Colville, J.F.**, and Cohen, C. (2022). Terrestrial Biodiversity Specialist Assessment. Duyker Eiland Prospecting Rights. Prepared for Elemental Sustainability (Pty) Ltd.
- **Colville, J.F.**, and Cohen, C. (2022). Terrestrial Animal Species Specialist Assessment. Proposed mixed use housing development. Prepared for EcoSense CC.

- **Colville, J.F.**, and Cohen, C. (2022). Terrestrial Animal Species Specialist Assessment. Proposed agricultural development. Prepared for McGregor Environmental Services.
- **Colville, J.F.**, and Cohen, C. (2022). Terrestrial Animal Species Specialist Assessment. Blue Sky's Project Prepared for Doug Jeffery – Environmental Consultants.
- **Colville, J.F.**, and Cohen, C. (2022). Terrestrial Animal Species Specialist Assessment. Proposed Expansion of Nature's View Dam near Citrusdal. Prepared for Earth Grace Environmental Consultancy.
- **Colville, J.F.** (2021). Terrestrial Animal Species Specialist Assessment. Proposed enlargement of existing Kleigat Dam. Prepared for Earth Grace Environmental Consultancy.
- **Colville, J.F.** (2021). Terrestrial Animal Species Specialist Assessment. Moorreesburg Wastewater Treatment Works Upgrade Project. Prepared for Zutari (Pty) Ltd.
- **Colville, J.F.** (2021). Terrestrial Animal Species Specialist Assessment. Maxnau Citrus Development. Prepared for Charl de Villiers Environmental Consulting.
- **Colville, J.F.** (2021). Terrestrial Animal Species Specialist Assessment. Gletwyn Estate Mixed Use Development. Prepared for Johan Neethling Environmental Services cc.
- **Colville, J.F.** (2021). Terrestrial Animal Species Specialist Assessment. Moorreesburg Wastewater Treatment Works Upgrade Project. Prepared for Zutari (Pty) Ltd.
- **Colville, J.F.** (2021). Terrestrial Animal Species Specialist Assessment. Proposed Development of Solar Photo-Voltaic Renewable Energy Power Station. Prepared for Resource Management Services (RMS).
- **Colville, J.F.** & Picker, M.D. (2009-2010). *Invertebrate impact assessment – Oudekraal, Table Mountain*. Prepared for Doug Jeffery Environmental Consultants.
- Picker, M.D. & **Colville, J.F.** (2007). *Invertebrate impact assessment: Worcester Island Development*. SRK Environmental impact report for Consulting Engineers and Scientists, Cape Town.
- Picker, M.D. & **Colville, J.F.** (2006). *Baseline faunal investigation for proposed development at Altona, Worcester, Western Cape Province*. Environmental impact report for SRK Consulting Engineers and Scientists, Cape Town.
- **Colville, J.F.** & Picker, M.D. (2005). *Scoping Phase II: The impact of development of Worcester on the insect and scorpion fauna*. Environmental impact report for Chand Environmental Consultants, Cape Town.
- **Colville, J.F.** (2001) *Scoping and faunal assessment for proposed housing development, Skapenberg, Somerset West*. Prepared for Design consultants CNdV Africa

MEMBERSHIPS/RESEARCH ASSOCIATE

- Membership of Entomological Society of Southern Africa (2007-current).
- Membership of Lepidopterists Society of Southern Africa (2014-current).
- Honorary Research Associate (HRA), Statistics in Ecology, Environment and Conservation (SEEC), Department of Statistical Sciences, UCT (2014-current).
- SACNASP registration for Ecological Science (Professional Natural Scientist) (member#: 134759).

PROFESSIONAL SERVICES

- Editorial board *African Entomology* (2010-current).
- Editorial board *Metamorphosis* (2017-current).
- Editorial board *PeerJ* (2019-current).
- CAPE Invasive Alien Animal (IAA) Working Group (2016-2018).