Dave Edge & Associates

Biodiversity Surveys Environmental Consulting

REVISED SCOPING STUDY – BUTTERFLIES

HARTENBOS GARDEN ESTATE

ERF 3122 MOSSEL BAY, WESTERN CAPE PROVINCE

Prepared for:

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CapeEAPrac
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[acting on behalf of Hartenbos Hills Propco (Pty) Ltd]

24th March 2021

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CREDENTIALS OF THE CONSULTANT

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Expertise

- Qualifications: BSc (Zoology & Botany) UNISA; BSc (Hons) (Environmental Science) North-West University; MSc (Environmental Science) North-West University; PhD (Environmental Science) North-West University; Pr Nat Sci (Ecological Science) SACNASP.
- Experience: Lepidopterist and ecologist with over 60 years' experience studying butterflies. Has conducted numerous specialist butterfly surveys in terms of NEMA.
- Publications/ conferences: 38 scientific papers published in peer reviewed journals, and has presented papers at a number of national and international conferences.

A more detailed CV is attached as Appendix 1.

Conditions pertaining to this report

The content of this report is based on the author's best scientific and professional knowledge as well as available information. Dave Edge & Associates reserve the right to modify the report in any way deemed fit should new, relevant or previously unavailable or undisclosed information become known to the author 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 the author. 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 make reference 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.

NATIONAL LEGISLATION AND REGULATIONS GOVERNING THIS REPORT

This is a 'specialist report' compiled in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014.

DECLARATION BY THE INDEPENDENT PERSON WHO COMPILED THIS REPORT

I, **David Alan Edge**, as the appointed independent specialist hereby declare that I:

- act/ed as an independent specialist in this application;
- 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;
- have and will not have any vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2014 (specifically in terms of Regulation 13 and Appendix 2 of GN No. R. 982) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- 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;
- 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; have ensured that the names of all interested and affected parties that participated in terms of the specialist input/study were recorded in the register of interested and affected parties who participated in the public participation process;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; and am aware that a false declaration is an offence in terms of regulation 48 of GN No. R. 982.

Signature of the Specialist:

_____

David Alan Edge

Pr Nat Sci (Ecological Science)

Representing:

Dave Edge & Associates

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1. Introduction

Cape EAPrac were originally engaged by ATKV Sake (Pty) Ltd (ATKV) to carry out an Environmental Scoping Study (ESS) for a proposed property development project on Erf 3122 Mossel Bay, then entitled Hartenbos Heuwels, with the original layout as detailed in Fig. 1. Ownership of the project was subsequently transferred to Hartenbos Hills Propco (Pty) Ltd (Propco), who is now the Applicant, and who has retained the services of Cape EAPrac to continue with the ESS. The project is now known as the Hartenbos Hills Garden Estate.

A summary of the biodiversity specialist studies already conducted on the project follows:

1) A botanical scoping study of the site was conducted by Dr D.J. McDonald of Bergwind Botanical Surveys and Tours (DJM) and a report was submitted on 12th March 2018 (McDonald, 2018).

2) When Cape EAPrac became aware of the possible presence of endemic or threatened butterflies at the site, they appointed butterfly expert Dr D.A. Edge of Dave Edge & Associates (DAE) on 20th March 2018 to identify if there were any constraints to development posed by the presence of threatened or rare butterfly taxa (species or subspecies).

3) DAE presented a draft report on 21st April 2018 alerting Cape EAPrac and ATKV to the presence of an Endangered butterfly *Aloeides trimeni southeyae* (Appendix 2), within the footprint of the proposed development. Following a request from Cape EAPrac, DAE revised his report to delineate a proposed butterfly reserve on 14th May 2018 (Edge, 2018a) (Fig. 2).

4) Cape EAPrac and ATKV considered the 14th May report and its conclusions and recommendations. They realised that the proposed butterfly reserve would have a serious impact on the viability of the proposed development of Erf 3122 Hartenbos Heuwels, since it overlapped with the proposed medical centre, which is a crucial component of the envisaged project.

5) Cape EAPrac provided DAE with a plan of the project layout overlaid with the area of the proposed butterfly reserve, and asked that another visit be made to the site to see if there was any possibility of a compromise. They also arranged for DJM to come to the site. The author conducted another site visit on 17th August 2018, to further investigate the occurrence of butterflies and their host plants on the site, accompanied by DJM to reconfirm the botanical aspects. DAE presented his report on 18th September (Edge, 2018b) and reached the following conclusions and recommendations:

    - From evidence available there is no clear pattern of association between the distribution of *A. trimeni southeyae* and the distribution of the probable food plants i.e. *Hermannia* spp. at Hartenbos Heuwels. There appears to be a much stronger three-cornered association between the larval stage of the butterfly, its host ant species (*Lepisiota* sp.) and one or more species of *Hermannia* (Appendix 3). The ants are dependent on stony habitat (under which they make their nests), and hence the occurrence of surface pebbles in sufficient density was used as the indicator for mapping the proposed butterfly reserve.
    - Since the 'butterfly reserve' has highly specific characteristics that are not replicated elsewhere on the site, it is suggested that a meeting be held between the developer's architects/ town planners and the environmental consultants, preferably after further botanical and butterfly investigations are concluded during the period September to November 2018. The objectives of the meeting would be to (a) to further explain the specificity of the butterfly / habitat association and (b) to discuss alternative layouts so that the butterfly reserve could be accommodated in the optimal location.

6) Meanwhile, after further discussions with ATKV, Cape EAPrac asked DAE to expand the scope of investigation to include the adjacent municipally owned properties delineated in Fig. 3, in order to establish whether the Endangered butterfly occurred on this property, or whether suitable habitat existed to which the Endangered butterflies could be translocated.

7) DAE presented his findings in a report dated 12th December 2018 (Edge, 2018c). His main conclusions were:

    - *Aloeides trimeni southeyae* (Appendix 2) only occurs within the area of the proposed butterfly reserve, in the vicinity where *Lepisiota* ant nests are found, and the putative butterfly host plant *Hermannia lavandulifolia* also occurs.

- This Endangered species has not been found at all the other places where surveying has taken place, including the municipal erf 1853.

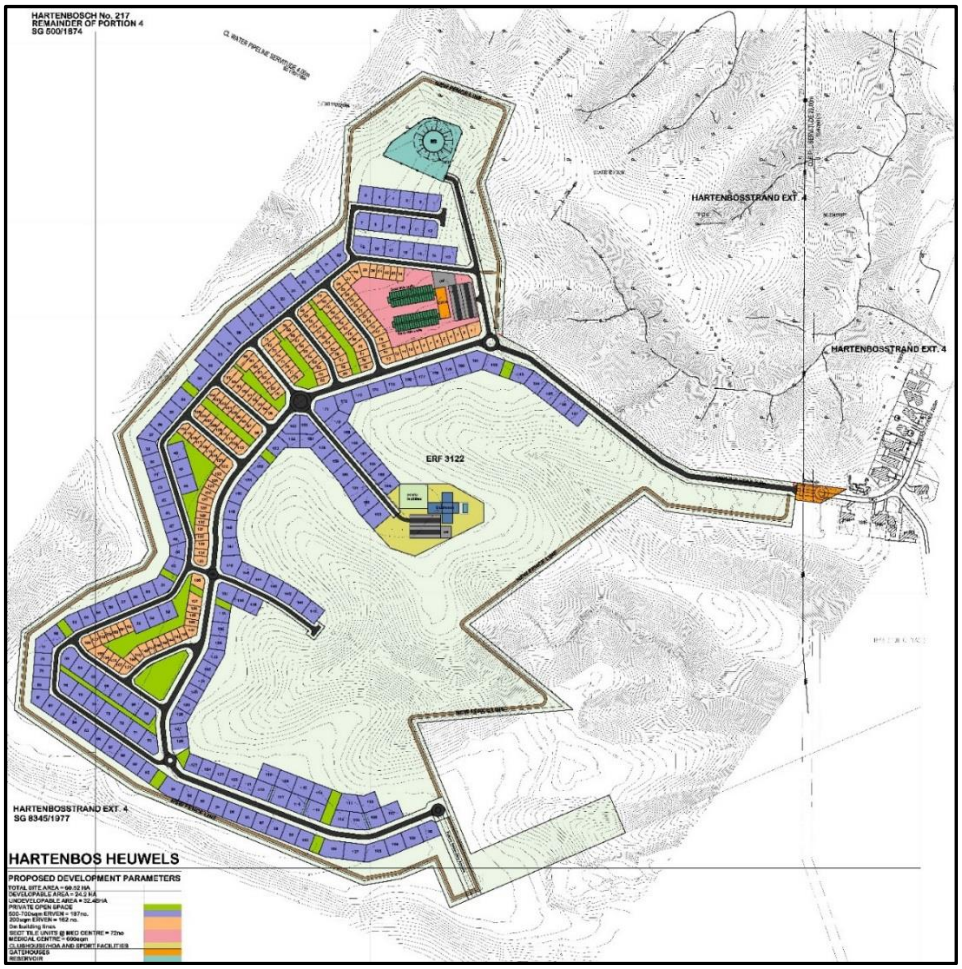

Figure 1 – Original development proposal for Hartenbos Heuwels

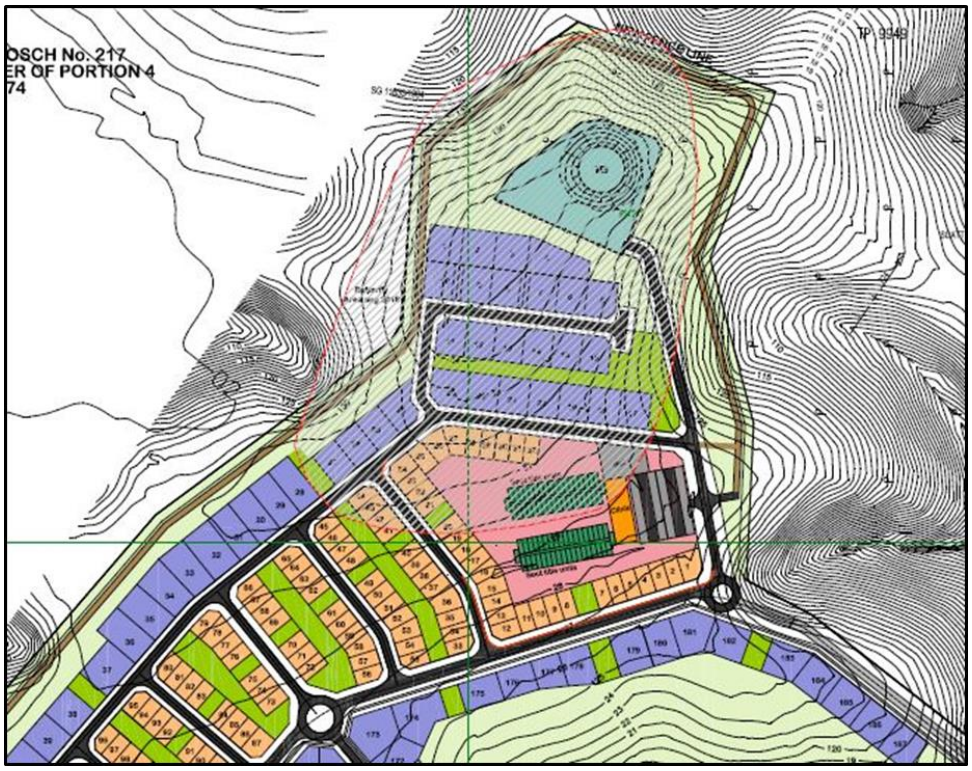

Figure 2 – Overlay of proposed butterfly reserve (thin red dashed line) on the development proposal

Figure 3 – Expanded study area including contiguous municipal properties (extracted from report by Nick Helm Botanical Surveys [Helm, 2018])

- The municipal erf 1853 is ecologically in better condition than erf 3122, having never been ploughed.
- The butterfly reserve originally proposed (Edge, 2018a) is still necessary, although some reduction of its area is possible, to allow the medical centre to be retained closer to its originally planned position. Repositioning of the residential units north of the medical centre will be necessary to avoid losing the Endangered butterfly *Aloeides trimeni southeyae*.
- All recommendations made in earlier reports (e.g. Helm, 2018) regarding alien plant removal, fire management regime, and corridors for animal movements, also need to be implemented.

2. Comments on the latest development layout

Cape EAPrac have provided the latest development layout (Fig. 4). The following issues need to be clarified and addressed:

1) The outer perimeter security fence/ wall should not go around the reservoir, but must be situated so that the proposed butterfly reserve is entirely outside the security perimeter. It is extremely important that there is unimpeded movement of animals across the butterfly reserve area, in order to maintain its ecological integrity (see Fig. 5).
2) The existing unsurfaced road to the reservoir has to be retained so that ground disturbance inside the butterfly area is kept to an absolute minimum.
3) The municipal operations and maintenance staff have to have unimpeded access to the reservoir, its pipelines, and other equipment (this aspect needs to be further discussed with the Mossel Bay Municipality, if this has not already been done).

3. Comments on the screening report

No butterflies are listed in the screening report. The author has examined the data submitted to SANBI for the revised conservation assessments of South African butterflies. This same data was used to inform the screening report. Hartenbos Heuwels was recorded as a locality, but the coordinates provided were incorrect. Consequently the screening tool did not pick up Hartenbos Heuwels as a place where *Aloeides trimeni southeyae* occurred. The correct coordinates were recorded by the author on 19th November 2018 (34°07.490 S; 22°05.095 E).

Figure 4 – Hartenbos Garden Estate Preferred Site Development Plan concept.

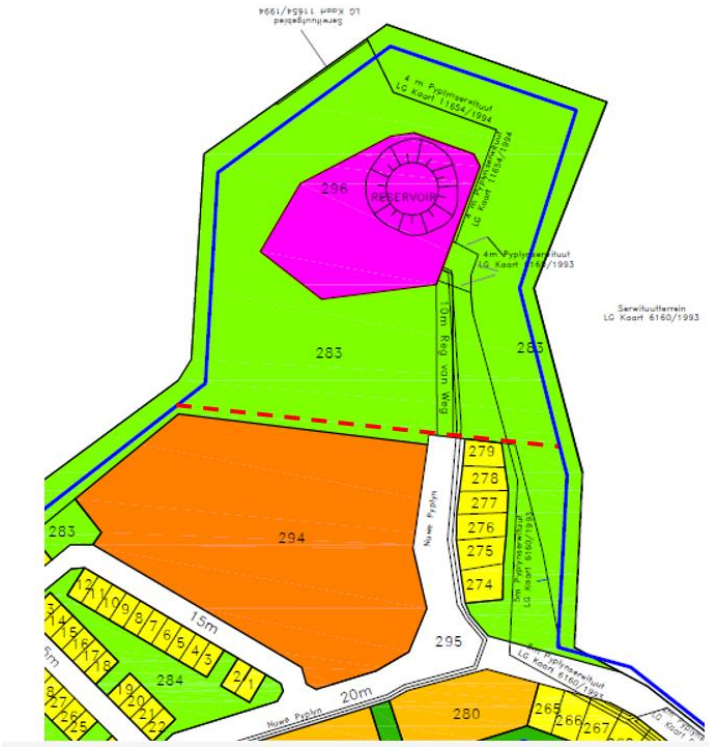

Figure 5 – Hartenbos Garden Estate with revised fencing to exclude the butterfly/reservoir area (red dashed line).

4. References

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EDGE, D.A. 2018b. *Butterfly scoping study – Hartenbos Heuwels Erf 3122 Mossel Bay, Western Cape Province. Follow-up report.* 18th September 2018. (Unpublished report prepared for Cape EAPrac and ATKV).

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HELM, N. 2017. *Conservation management plan for municipal land on Hartenbos Heuwels, Mossel Bay, Western Cape.* 18th October 2017. (Unpublished report prepared for Cape EAPrac and Mossel Bay Municipality)

MCDONALD, D.J. 2018. *Botanical scoping assessment Erf 3122, Hartenbos Heuwels, Mossel Bay Municipality, Western Cape Province*. 12th March 2018 (Unpublished report prepared for Cape EAPrac).

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Dr. D.A. Edge

24th March 2021

Dave Edge & Associates

APPENDIX 1

CURRICULUM VITAE

DAVID ALAN EDGE

Date of birth: 22nd August 1943
Place of birth: Ormskirk, Lancs., UK
Residence: Brenton-on-Sea, Knysna, Western Cape

QUALIFICATIONS

1965 MA (Cantab) – Mechanical Engineering
2001 BSc (cum laude) – Zoology & Botany (UNISA)
2002 BSc (Hons) (cum laude) – Environmental Science (Potchefstroom University)
Specialising in Biodiversity and Conservation biology
2006 PhD in Environmental Sciences – North-West University. Thesis entitled "The ecology and conservation of the Brenton Blue"

ENGINEERING & MANAGEMENT CAREER

1965 – 1993 **Nchanga Consolidated Cpper Mines, Zambia**
Assistant Divisional Engineer
Maintenance engineering and management
1973-1979 **Palabora Mining Company**
Assistant General Manager
Operations and maintenance management, mechanical engineering and extractive metallurgy, general management
1979-1993 **LTA Process Engineering**
Managing Director
General management, marketing, project engineering and management, design engineering, procurement and construction management.

LEPIDOPTERISTS'S SOCIETY OF AFRICA (LEPSOC AFRICA)

1983 Founder member
1984–1986 Council member
1993–2016 Representative – Southern Cape
2008–2011 Treasurer
2011–2018 Editor – *Metamorphosis,* a scientific journal dedicated to the study of African Lepidoptera

CONSERVATION ACTIVITIES

1993–1996 Leading role-player in the campaign to save Brenton Blue
1995–2018 Brenton Blue Management Committee - member and leader of research programme
1999–2018 Knysna Environmental Forum - Co-chairman
2005–2018 Brenton Blue Trust – Trustee
2008–2013 South African Butterfly Conservation Assessment (SABCA)
Digitised own collection of over 8000 specimens of South African butterflies. Project leader for the southern Cape – an area of 60 000 sq. km, supervising three other field workers. Field surveys yielded over 2500 new species–QDGS records. Editor of South African Butterfly Atlas, lead author for Chapters 3 and 4 (see publications below). Authored over 100 species accounts (out of 800)
2011–2018 Leader of the Conservation of Rare and Endangered Lepidoptera (COREL) programme for South Africa, including being "Custodian" for six species.
2015-2018 Project Director for the South African Lepidoptera Conservation Assessment (SALCA) project carried out for the South African Biodiversity Institute (SANBI)
2015-2018 Taxon Lead – Butterflies for the BioGaps project to establish the biological diversity of the 'Shale Gas Fracking" area of the Karoo
2015-2018 Project Coordinator of the "Butterfly Evolutionary Diversity" project to obtain DNA samples for all c. 800 South African butterfly species

ENVIRONMENTAL CONSULTING

Dave Edge & Associates
Environmental Consulting

1997 – 2001	Sparrebosch, Knysna	Detailed butterfly surveys for EIA and monitoring
2000 – 2004	Roodefontein, Plettenberg Bay	Butterfly surveys for scoping report and EIA
2001	Pezula Estate, Knysna	Preliminary assessment of butterfly potential
2001	The Cove, Knysna	Preliminary assessment of butterfly potential
2001 – 2003	Fernwood, Knysna	Butterfly surveys for scoping report and EIA
2003 – 2004	The Lakes, Sedgefield	Butterfly survey for scoping report and EIA
2004 – 2005	Lagoon Bay, Glentana	Butterfly survey for scoping report and EIA
2004 – 2006	Paradise Coast, Mossel Bay	Butterfly survey for scoping report and EIA

2004 – 2005	Pezula@Hunters, Knysna	Butterfly survey for scoping report and EIA
2004 – 2006	Uitzicht 216-176, Knysna	Butterfly survey for scoping report and EIA
2004 – 2008	Pierpoint Nature Estate, Knysna	Butterfly survey for scoping report and EIA
2005 – 2006	Erf 4016 Eastford, Knysna	Butterfly survey for scoping report
2006 – 2007	Stilbaai Farm 485/51	Butterfly survey for scoping report
2006 – 2008	Destiny Africa, George	Butterfly survey for scoping report
2008	Escom, Nuclear Power Stations	Preliminary assessment of butterfly potential
2009	Pierpoint Nature Estate, Knysna	Research programme to establish ecology of *A. almeida*
2009 – 2010	Escom, Nuclear Power Stations	Detailed butterfly surveys (3 power station sites)
2011 – 2012	Uitzicht 216-77, Brenton	Biodiversity survey for scoping report
2012	Green View Estate, Mossel Bay	Butterfly survey for scoping report
2015	Zeelandsnek, Oudtshoorn	Butterfly survey for scoping report
2015 – 2018	Mossel Bay Cemetery project	Butterfly survey for scoping report; monitoring programme
2016	Schaapkraal, Cape Town	Butterfly scoping and sensitivity report
2016 – 2019	Entabeni Estate, Knysna	Management plan for butterfly reserve
2016 – 2019	Uitzicht 216-71 & 72, Brenton	EIA for development proposal
2017 – 2021	Hartenbosheuwels	Butterfly scoping study
2019	Abalone Hatchery, Gouritsmond	Desk top study – butterflies
2019	Lamloch Safari Park, Kleinmond	Butterfly survey
2019	Village-on-Sea, Mossel Bay	Butterfly survey
2019	Mossel Bay Golf Estate	Butterfly survey
2020	Rouen Farm	Butterfly survey and issue of Terrestrial Biodiversity Compliance Statement (TBCS)
2020	Drakenzicht	Butterfly survey and issue of TBCS
2020	Still Bay Cemetery	Desktop study and issue of TBCS
2020	Butterfly Blue, Stellenbosch	Desktop study and issue of TBCS
2020	Nuweveld Wind Farms	Desktop study; butterfly survey; and issue of TBCS

ACADEMIC CAREER

2009–2014 **North-West University (Potchefstroom)**
Senior Lecturer
Developed new post graduate teaching module for "Conservation Ecology"
Lectured to postgraduate (honours and masters) students on Conservation Ecology; including setting and marking assignments and examination papers.

AWARDS

1998 The Habitat Council "for outstanding achievements in the field of environmental conservation and management – for his role in helping to secure the habitat of the endangered Brenton Blue butterfly"
2003 LepSoc Africa – June 2003 – Chairman's Award "for the most significant contribution to African Lepidoptera conservation for the period July 2002 – June 2003"
2013 LepSoc Africa – October 2013 – President's Award "for his passion and commitment leading the development and completion of the new e-*Metamorphosis* web journal.

PUBLICATIONS IN SCIENTIFIC JOURNALS

EDGE, D.A. 1982. Re-discovery of *Erikssonia acraeina* Trimen. *Rostrum,* **1**(2): 2
EDGE, D.A. 1985. Life history of *Iolaus diametra natalica* Vàri. *Metamorphosis,* **1**(13): 4–6
EDGE, D.A. 1987. Life history of *Iolaus pallene* (Wallengren). *Metamorphosis,* **1**(19): 3–5
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EDGE, D.A. 2008a. Adult behaviour of *Orachrysops niobe* (Trimen) (Lepidoptera: Lycaenidae). *Metamorphosis* **19(3)**: 116-126.
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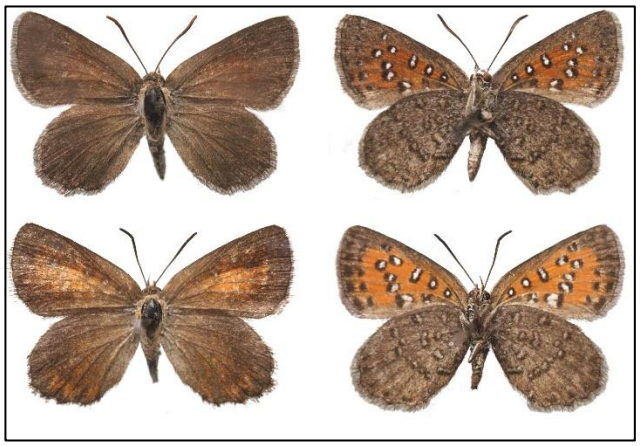
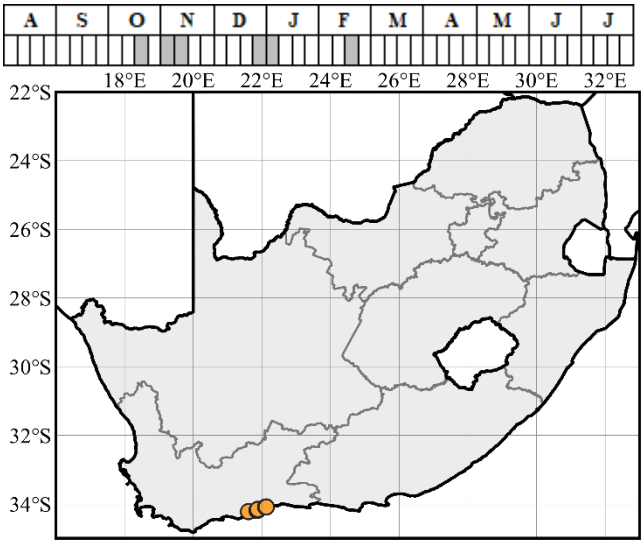
APPENDIX 2

Aloeides trimeni southeyae Tite & Dickson, 1973
Mossel Bay Brown Russet; Mosselbaai Bruin Kopervlerkie

David A. Edge

EN B1ab(ii,iii)+2ab(ii,iii)
Endemic





Type locality: Cape province: nr Mossel Bay.

Taxonomy: There are no notable issues.

Distribution: Endemic to the southern coastal region in the Western Cape province in South Africa, between Albertinia in the west and Hartenbos in the east, south and north of the N2 highway.
Habitat: Gentle north-facing slopes, sparsely covered by low shrubs with bare ground in between. Low intensity grazing improves the habitat.

Vegetation types: FFs15 North Langeberg Sandstone Fynbos, FRs14 Mossel Bay Shale Renosterveld.

Assessment rationale: A taxon with a restricted range endemic to the southern coastal region in the Western Cape province, South Africa, with an EOO of 85 km^2 and AOO of 24 km^2. There are three widely separated locations, which are severely fragmented and between 17–30 km apart, far greater than the average dispersal distance of the taxon of 1–2 km. The landscape between these locations is transformed by agricultural, industrial or urban developments. The subpopulations are either very small or declining in AOO and numbers of individuals, and the quality of the habitat is declining due to overgrazing by livestock, suppression of fires, and invasion by alien plants (see Threats section). It therefore qualifies as Endangered under criterion B.

Change in status from SABCA: The status has not changed from the previous assessment.

Threats: Most of the subpopulations are threatened by human-related activities, including grazing by domestic livestock, suppression of natural fires, and encroachment of alien plants.

Conservation measures and research required: An autecological study of this taxon is needed, to determine its life history and whether there is an associated host plant and ant. This should be followed by the development and implementation of an environmental plan, which would include protection of the habitat needed by the taxon as well as ongoing monitoring of the populations. The Hartenbosheuwels locality is owned by the Afrikaanse Taal en Kultuurvereniging (ATKV) and investigations are ongoing to make it into a nature reserve.

Source of information:

Mecenero *et al.* 2020: 55.

APPENDIX 3

HERMANNIA SPECIES FOUND INLAND IN THE SOUTH EASTERN REGION OF THE WESTERN CAPE

[Excerpted from Manning & Goldblatt (2012)]

Hermannia althaeifolia L.

Softly hairy, mealy, grey-green shrublet to 50cm, sometimes erect and single-stemmed. Leaves long-petiolate, ovate to elliptic, toothed and crisped, with brown, leafy stipules. Flowers in terminal and axillary clusters, yellow, calyx reddish fading to creamish coloured, inflated. Clay, granite and limestone slopes. Aug-Oct.

Hermannia flammea Jacq.
Sparsely branched, often glabrescent shrublet to 80cm. Leaves oblanceolate to cuneate, subsessile, usually sparsely toothed above. Flowers small clusters on slender peduncles, dark red, throat narrow and petals spreading, calyx lobes spreading and papery. Mostly clay flats and slopes. Sept-Oct.

Hermannia lavandulifolia L.
Grey-mealy, diffusely twiggy shrub to 60cm. Leaves grey-velvety, oblanceolate. Flowers few, in small clusters, yellow, throat narrow and petals spreading, calyx deeply lobed and flaring. Clay slopes on renosterveld. Sept-Oct or Feb-Apr.

Hermannia saccifera (Turcz.) K. Schum.
Glabrescent and viscous, sprawling shrublet to 40cm. Leaves elliptic-oblong, regularly toothed. Flowers usually two, on short, axillary peduncles, bell-shaped, yellow, bracts connate into a small cup. Stony clay slopes, usually disturbed sites. Aug – Oct.