Faunal Impact Assessment

Project: Franschhoek Skytram

Compiled for Doug Jeffery – Environmental Consultants
Applicant: The Franschhoek Cableway Company (PTY) LTD

Franschhoek Skytram (UPDATED REPORT)

September 2023

Report Information

Document name	**Franschhoek Skytram– Faunal Impact Assessment**
Number of pages:	**68**
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Document version:	1.0

Citation

Colville, J.F., Cohen, C., Ward, V. 2023. Faunal Impact Assessment for Project Franschhoek Skytram, Franschhoek. Prepared for Doug Jeffery – Environmental Consultants; Updated Report. 05 September 2023.

Executive Summary

Doug Jeffery – Environmental Consultants ("Doug Jeffrey") has been engaged by The Franschhoek Cableway Company (PTY) LTD to undertake a Basic Assessment for a proposed Cable Way project (Franschhoek, Western Cape Province). The proposed cableway project will entail several new infrastructure developments associated with a bottom and a top cable station, and the suspension of overhead cables. Doug Jeffrey has appointed Jonathan Colville of Terrestrial Ecologist & Faunal Surveys and Callan Cohen and Vincent Ward of Birding Africa to undertake a faunal specialist study, with particular focus on the avifauna, as part of the Basic Assessment (BA) process.

In January 2022, a faunal site sensitivity assessment by Colville *et al*. (2022) concluded a high probability of several faunal SCC (Species of Conservation Concern) occurring at the proposed development site and that a specialist faunal survey and impact assessment would be required. The assessment identified several areas as high to very high faunal sensitivity and put forward several recommendations for invertebrate, amphibian, and avifaunal SCC. The potential negative impact on avifaunal SCC through cable collisions was flagged as of particularly high concern from a faunal perspective and a 12-month bird flight path study focussing on the cliff face was proposed covering the period February 2022 – February 2023, inclusive.

This specialist study details the faunal characteristics of the proposed cableway development and the possible impacts on local faunal SCC, with a primary focus on the avifauna. Impacts for the various phases of the infrastructure development are assessed for the two alternatives (and no-go option) at the planning, design and development and operational phases. Several mitigation measures related to potential impacts are put forward to reduce the likely impact of the proposed cableway development. Several management actions and management outcomes are also proposed for inclusion into a draft EMPr.

The expected impacts of the proposed infrastructure development for the Franschhoek Skytram include habitat loss associated with fynbos vegetation for insect and ground-dwelling bird SCC; cables bisecting flight corridors for Verreaux's Eagle and introducing cable collision risks; disturbance caused during the construction and operational phases on all faunal SCC; and bird collisions with glass windows/walls of cable station buildings. These impacts are of primary concern for the Top Station and for Verreaux's Eagle, although it should be noted that there are no nesting sites for Verreaux's Eagle in the vicinity of the study site. An earlier alternative that was considered included a proposed access road; this had the potential to have high negative impacts on several aquatic insect SCC and a frog SCC. This alternative was eventually withdrawn, as the access road was considered a "fatal flaw".

The primary mitigation measures required to reduce the potential impacts on faunal SCC should include: minimise destruction and disturbance of natural fynbos habitat (vegetation and aquatic habitat) to within the footprint of the proposed development; reduce the effect of artificial light at night (ALAN) on insects, installing bird deterrent markers on windows and glass walls; installing bird diverters/markers on cableway cables; and undertaking an extended bird monitoring programme starting at and to continue through the construction phase and to extend to the operational phase for a period of three years. The relative scarcity of cableways in South Africa means that there is no available scientific literature or established best practice guidelines with regards to collision risks posed by a cableway. South African guidelines for impact assessment,

monitoring, and mitigation of large-bodied raptors with regards to windfarms/power lines, offer some context and scientific insights for bird collision risks from cableways. However, because of the uncertainty around the suitability of such data as a proxy for assessing collision risks, and because of the lack of data specifically for large raptor collisions with cableways, the extended monitoring programme is considered of high importance. Such long-term monitoring may also help to better inform on the impacts of similar future infrastructure projects on local raptor populations.

Cumulative impacts may become more significant if added to existing or future impacts from other activities in the area. Loss of mountain fynbos habitat associated with Kogelberg Sandstone Fynbos is considered of conservation concern. The proposed development will therefore occur in a broader area within a mosaic of vegetation and habitat that is highly fragmented and disturbed. In addition, the proposed development falls within an Important Bird Area (IBA): Boland Mountains. Considering that the vegetation and insect SCC (grasshopper, butterfly, and katydid) occur in a large surrounding area of undisturbed fynbos habitat, and that the development footprint is relatively small, the overall cumulative impacts of the development for both alternatives is considered likely to be medium (minor cumulative effects) for the insect SCC. For Verreaux's Eagle, it is considered that the cumulative impacts for the cableway project will result in minor cumulative effects (medium) considering the low likelihood of cable collision and displacement.

The proposed Franschhoek Skytram development is unlikely to generate significant negative impacts on any of the insect or ground-dwelling bird SCC flagged for this project, once mitigation is followed. Based on the low incidence of large raptor collisions with power lines, no records to date of large eagles colliding with the cables of cableways, no nest of Verreaux's Eagle in the vicinity of the study site, and based on the long-term occurrence of a breeding pair of Verreaux's Eagle in close proximity to the Table Mountain Aerial Cableway with no incident, the likelihood of a cable collision is considered low. On-going monitoring should help inform an adaptive management type-approach to help manage unforeseen negative impacts. Overall, it is the specialists' opinion that the proposed development will have an overall low-medium significance on all the faunal SCC flagged and therefore the proposed development can be approved in terms of the specific theme of this terrestrial animal species assessment: largely on the condition that all mitigation measures are implemented and that an extended bird monitoring programme be undertaken, starting at and continuing through the construction phase and extending to the operational phase for a period of three years, as suggested by Birdlife South Africa best practice guidelines.

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Specialist Details

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Jonathan Colville of Terrestrial Ecologist & Faunal Surveys has 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. Between 2009 and 2019, Jonathan 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 animal and plant diversity. Since 2020, Jonathan has been operating as a specialist faunal consultant for EIAs and conservation projects. A CV is provided below in Appendix 1.

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Areas of Specialisation	Ornithology, Ecology, Odonata

Callan Cohen (Director of Birding Africa) 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 (Barnes, 2000). He has over 30 years of experience of bird field surveys. A CV is provided below in Appendix 2.

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Vincent Ward (core member of Birding Africa) has over 20 years' experience in bird conservation and bird field surveys. Vincent has worked for CapeNature and the Avian Demography Unit at the University of Cape Town. He also has several years' experience providing avifaunal specialist input

and undertaking field surveys for impact assessments for Renewable Energy projects, such as wind and solar farms. A CV is provided below in Appendix 3.

Signed Statement of Independence:
A signed statement of independence will be provided as a separate document.

Conditions Pertaining to this Report

The content of this report is based on our best scientific and professional knowledge, and available information. We reserve the right to modify the report in any way deemed fit should new, additional, relevant, or previously unavailable or undisclosed information becomes known to us from on-going research or further work in this field, or pertaining to this investigation, and we will inform Doug Jeffery – Environmental Consultants accordingly. This report must not be altered or added to without the prior written consent of Jonathan Colville, Callan Cohen, and Vincent Ward. 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.

Introduction

Doug Jeffery – Environmental Consultants ("Doug Jeffrey") has been engaged by The Franschhoek Cableway Company (PTY) LTD to undertake a Basic Assessment for a proposed Cable Way project (Franschhoek, Western Cape Province).

Doug Jeffery – Environmental Consultants 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).

Utilising the results from the Screening Tool the development footprint at the Top Site was rated as "High" sensitivity for six animal species of Conservation Concern (SCC), with possible suitable habitat for:

- Three orthopteran insect species:
    - Two katydid species (Medium Sensitivity): *Brinckiella aptera* and *Conocephalus peringueyi*
    - One grasshopper species (Medium Sensitivity): *Aneuryphymus montanus*
- Three bird species:
    - Verreaux's Eagle (High Sensitivity) (*Aquila verreauxii*)
    - Striped Flufftail (Medium Sensitivity) (*Sarothrura affinis*)
    - Fynbos Buttonquail (Medium Sensitivity) (*Turnix hottentottus*)

The Screening Tool identified the development footprint at the Bottom Site as: "Medium" sensitivity for three orthopteran insect species of Conservation Concern (SCC), with possible suitable habitat for:

- Two katydid species:
    - *Brinckiella aptera* and *Conocephalus peringueyi* (Medium Sensitivity)
- One grasshopper species:
    - *Aneuryphymus montanus* (Medium Sensitivity)

On 27 January 2022, Colville *et al.* (2022) compiled a site sensitivity assessment report, including a site visit and desktop study, for the proposed cable way project (PDFs provided by Doug Jefferey on 14 December 2022; Figure 1 in Colville *et al.*(2022) shows estimated footprint). This report assessed the six SCC flagged. It also assessed several animal SCC that were not flagged by the screening tool. These included:

- Seven butterfly species:
    - *Aloeides pallida grandis*
    - *Chrysoritis endymion*
    - *Chrysoritis nigricans nigricans*
    - *Thestor holmesi*
    - *Thestor montanus*
    - *Lepidochrysops oreas junae*
    - *Tsitana dicksoni*
- Six dragonfly/damselfly species:
    - *Orthetrum rubens*
    - *Spesbona angusta*

    - *Syncordulia serendipator*
    - *Syncordulia gracilis*
    - *Syncordulia venator*
    - *Syncordulia serendipator*
- Three bird species:
    - *Chaetops frenatus (Cape Rockjumper)*
    - *Monticola explorator (Sentinel Rock Thrush)*
    - *Geocolaptes olivaceus (Ground Woodpecker)*
- One frog species:
    - *Poyntonia paludicola* (*Montane Marsh Frog)*

The faunal site sensitivity assessment by Colville *et al.* (2022) for concluded a high probability of several of the SCC occurring at the proposed development site and that a specialist faunal survey and impact assessment would be required. The National Environmental Management Act, 1998 (Act No. 107 of 1998) stipulates that when a SCC is confirmed or is highly likely to occur on the project area, a Terrestrial Animal Species Specialist Assessment must then be undertaken.

The assessment identified several areas related to the Top Site as high to very high faunal sensitivity and put forward several recommendations. Highly sensitive areas included aquatic habitats for damselfly/dragonfly and frog SCC that could be negatively impacted by the proposed access road construction, and the cliff face that could negatively impact avifaunal SCC through cable collisions. The latter impact was flagged by Colville *et al*. (2022) in their site sensitivity report, and through discussions with Doug Jeffery and the Applicant, as of particularly high concern from a faunal perspective. Colville *et al.*(2022) put forward several recommendations including a summer survey of aquatic habitat for the damselfly/dragonfly and frog SCC, and a 12-month bird flight path study focussing on the cliff face where the proposed cables would run. This 12-month bird study would cover both breeding and non-breeding periods and potential inter-seasonal patterns (January 2022 – February 2023).

Other specialists [e.g. aquatic, botanical] also highlighted concerns about the proposed development for of an access road to the Top Site. As such, alternatives (including a preferred alternative) that excluded the access road were put forward. As this preferred alternative does not include the development of the access road, the concerns associated with the access road and its negative impact on important faunal aquatic habitat was therefore deemed to have fallen away and that field surveying of sensitive aquatic habitat for faunal SCC was therefore unnecessary. However, the primary concern associated with bird cable collision and secondary concerns associated with the Top and Bottom site for butterfly and orthopteran SCC remain. This impact assessment primarily focusses on potential impacts and reports on the results of the long-term bird monitoring study. It also assesses the potential impacts associated with butterfly and orthopteran SCC for the Top and Bottom sites.

Scope of Study

We were appointed by Doug Jeffery – Environmental Consultants on 17 February 2022 to conduct an impact assessment including a desktop study and a 12-moth bird monitoring study for the

Franschhoek Skytram Project. Based on the information obtained from these two phases, an assessment of the nature and the extent of the potential impacts of the proposed development on the populations of the faunal SCC located within the project area would be undertaken 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' and following SANBI's (2020) 'Guidelines for the Implementation of the Terrestrial Fauna and Terrestrial Flora Species Protocols for Environmental Impact Assessments In South Africa'*.

1. Following the impact assessment methodology provided by Doug Jeffery (Appendix 4), estimate of the nature and the extent of the potential impacts (direct, indirect, and cumulative) of the proposed development on the populations of the faunal SCC located within the project area, with a primary focus on the risk of bird collisions.
2. Assess impacts for the two alternatives and the no-go option at the planning design and development and operational project phases.
3. Provide potential mitigation measures to reduce the impacts of the development and provide monitoring requirements and recommendations for inclusion into a draft EMPr.
4. Provide a terrestrial animal species impact assessment report detailing the findings of the desktop study and 12-month bird monitoring survey and include a reasoned opinion, based on the findings of the specialist assessment process, regarding the acceptability or not of the development, and if the development should receive approval or not.

Considered Infrastructure of the Development

The infrastructure assessed in this impact assessment are those in the conceptual drawings for the Top and Bottom Sites, as given as PDF documents by Doug Jeffrey on 14 December 2022 and 14 August 2023, and in the footprint area (m^2) for each in Appendix 5. Impact was assessed based broadly on the type of infrastructure, footprint size and geographic position. In addition, the impact of the use of a helicopter(s) to ferry construction material and personal to the top site during the construction phase was also considered.

Assumptions and Limitations

The following limitations and assumptions apply to this assessment:

- 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.
- This impact assessment was undertaken based on the information provided to date by Doug Jeffery – Environmental Consultants.
- The bird monitoring study covered a 12-month period and therefore does not cover potential inter-annual patterns of bird movements and abundances.
- The relative scarcity of cableways in South Africa means that there is no available scientific literature or established best practice guidelines with regards to collision risks posed by a cableway. There is some literature from Europe and New Zealand specific to

cableways and overhead ski-cables, but few of these studies appear to highlight risks to large raptors. There is a larger body of work looking at the collision threats posed by wind farms and overhead electrical wires, both for South Africa and elsewhere, for a range of raptor species, but their relevance to this project is uncertain. For example, windfarms with their huge wind turbines are structurally and functionally very different to cableway cables and offer different risks to birds. However, published information, including several South African guidelines for impact assessment, monitoring, and mitigation of large-bodied raptors with regards to windfarms, offers some context and scientific insights for bird collision risks. There is also a paucity of local studies on the specific effects of the disturbance of infrastructure development for alpine bird species, such as Cape Rockjumper. Consequently, there is limited local information and published guidance specifically on the impacts of a cableway project on high-conservation and high-profile species, such as Verreaux's Eagle (*Aquila verreauxii*).

Methodology

The methodology used in this report, including a background desktop study and bird flightpath study, is outlined in the subsections below.

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 geographic distributions and habitat requirements for listed the SCC.
- Distributional records from FrogMap (http://frogmap.adu.org.za/), an atlas of African frogs, were also examined.
- Distributional records from the Southern African Bird Atlas Project (SABAP2 data (http://sabap2.birdmap.africa/)) for the bird SCC were examined.
- Data on Verreaux's Eagle nesting sites was sourced from relevant specialists.
- Taylor, Peacock and Wanless (2015) and online resources, such as BirdLife International (https://www.birdlife.org/projects/iucn-red-list/), were consulted for information on the conservation status of bird SCC.
- A map of South Africa's Important Bird Areas (IBA) (Marnewick *et al.*, 2015) was overlaid onto the Franschhoek Skytram project area. IBAs are selected using the presence of globally threatened species, groups of species with a restricted range (< 50 000 km2), species assemblages confined to a single biome, and congregations of one or more species.
- Expert opinion was also sought from large eagle specialists on their records and knowledge of collision incidents of Verreaux's Eagle (and the similar Golden Eagle) with cableways or

similar structures. Information on the nests of Verreaux's Eagle in the area was also gathered.

- Published information on faunal SCC were investigated to further assess their distribution range, ecology, habitat, and any life history requirements that would provide information towards assessing impacts. A desktop review of the available avifaunal information for wind farms and overhead wire/cable collisions was undertaken.

12-Month Bird Flightpath Study

An initial field visit was made to the proposed Upper Cableway station (Top Site) on 20th October 2021 by three faunal specialists (Colville *et al.*, 2022). A transect count of all birds seen and heard was made from the cell phone tower (-33.933, 19.147) to the Top Site (-33.917, 19.146). Additional ad hoc observations were made around the Top Site and along the route surveyed by the three specialists (Figure 2 in Colville *et al.*(2022)).

Subsequently, monthly site visits were made from February 2022 to February 2023, inclusive. Observations to detect raptor and other bird movements and potential flightpaths were made from a vantage point (-33.913, 19.143) – a parking area along the R45 with views of the Top Site and the length of the proposed cable. The mountainous slope and associated cliffs between Haute Cabriere and the Top Site are here referred to as the Slope Site. Collectively the entire area is referred to as the Study Site (Figure 1).

Observations commenced an hour before the Slope Site fell into direct sunlight and continued until approximately midday/early afternoon. A full bird species list was made during each visit. The flightpaths of raptors and other large birds were mapped with special attention being paid to birds moving over the Top Site, and those flying through the vertical plane of the proposed cable layout. All birds seen were identified to species level, and where possible age class was recorded. Weather parameters were recorded every hour.

Observations were logged into the BirdLasser cellphone application version 1.0.8 (Lejint Pty Limited). These records were subsequently submitted to the Southern African Bird Atlas Project (https://sabap2.birdmap.africa/).

The weather conditions were ideal on all visits apart from March and September, where low cloud prevented reliable flightpath observations from being made. In these two months species detected on the Slope Site were recorded (based on call and any visuals).

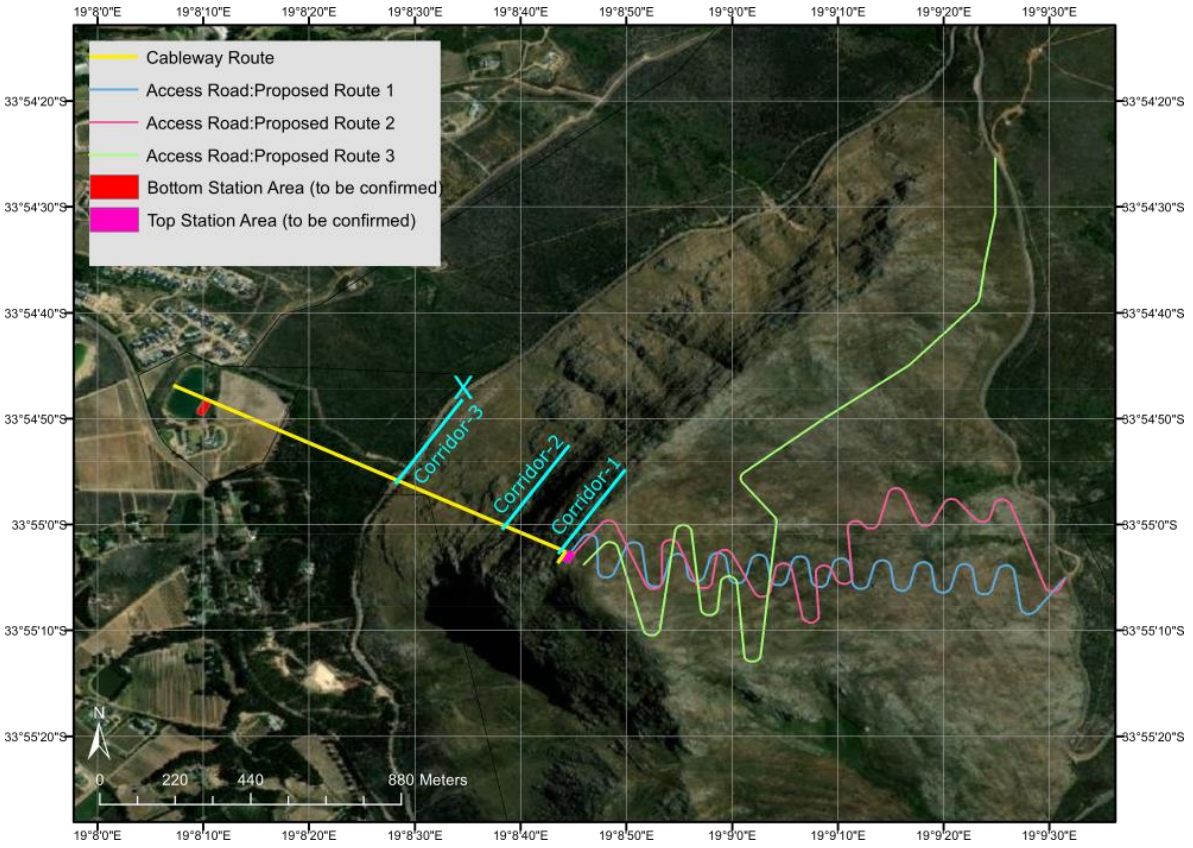

Figure 1: The primary flight corridors identified during the 12-month bird flightpath study overlaid onto the map of the project area. The mountainous slope and associated cliffs between Haute Cabriere and the Top Site are referred to as the Slope Site. Collectively the entire area is referred to as the Study Site. Three flight corridors were observed across the Slope Site. The blue X indicates the spot where scoping for raptors and other birds was undertaken. (Note the proposed access road routes of an earlier alternative, which has been withdrawn).

Description of the Site

Desktop Study

Review of available avifaunal information for cableway collisions

The novel nature of aerial cableways in South Africa means that there is limited local applicable scientific literature specific to cableway collision risks to any of the bird SCC flagged for Franschhoek Skytram. With the information available to us, as well as with discussions with other experts, there are no recorded collisions between Verreaux's Eagle and cableways. The closest available research involves collisions with wind farm turbines, power lines, and ski-lift cables. It is not known, however, how accurate of a proxy these are in assessing cableway collision risks for the Franschhoek Skytram project.

Bird collision with windfarms and overhead wires is considered a significant source of anthropogenic mortality (Bernardino *et al.*, 2018; BirdLife South Africa, 2018, 2017; Ralston-Paton *et al.*, 2017; Thaxter *et al.*, 2017). In their review of bird collisions with power lines, Bernardino *et al.* (2018) highlight that collision mortality can have significant population-level impacts, including for high conservation and economically important bird species (see also Thaxter *et al.*, 2017). They also

indicate that there is increasing evidence that mortality from collisions can cause behavioural changes in the migratory patterns and flightpaths of birds. They stress the importance of considering and implementing mitigation measures to new developments to minimise and obviate the risk of bird collisions with overhead wires and cables.

Bernardino *et al.* (2018) summarise that bird collision risk with overhead wires/cables are determined by several different factors that fall into three main groups: (1) species-specific factors (e.g. vision, morphology, phenology); (2) site-specific factors (e.g. topography, weather conditions, and habitat/vegetation features); and (3) wire/cable-specific factors (e.g. diameter, overhead height, spacing between wires/cables, path length).

Collision risk increases when cables and power lines cross the flightpaths of resident birds' daily movements. Birds may spend a large part of their day flying between breeding/nesting or roosting sites, and foraging areas increasing the risk of collisions with cables spanning across their flightpaths within their home ranges. Mountain passes and cliffs/ridges are known to act as leading lines and concentrate and channel flight paths, and raptors are known to fly at lower heights along high-elevation structures such as along rocky ridges (Bevanger, 1994). Mountains also provide excellent habitat for soaring-gliding birds due to the development of thermals and updrafts Although raptors appear infrequently to collide with power lines (Bernardino *et al.*, 2018; Mojica *et al.*, 2020), if these intersect their home ranges and hunting areas, then the risk of collision increases, as seen for certain eagle species (e.g. Tikkanen *et al.*, 2018; Mojica *et al.*, 2020). Hunting birds are thought to become distracted when focussed on prey detection and during aerial courtship and territorial displays, making them less aware and therefore at greater risk of overhead cables. Newly erected cables and wires crossing bird seasonal migration routes are also thought to increase collision risks (Bernardino *et al.*, 2018; Thaxter *et al.*, 2017). Importantly, a study by Luzenski *et al.* (2016) did not observe any bird collisions with power lines crossing an important migratory flightpath used annually by thousands of raptors. During the post-construction phase, raptors were observed to have altered their flight elevations, aided with the help of deflecting winds, and flew above the erected powerlines. However, several studies stress the importance of establishing flightpath patterns, both for daily and seasonal bird movements, for an area earmarked for cable/power lines construction as local conditions (e.g. deflecting winds) and local typography and vegetation structure determine a bird's ability to detect and avoid overhead structures, such as cables.

For South Africa, Ralston-Paton *et al.* (2017) summarised the impacts of bird collisions and wind farms. Verreaux's Eagle was listed as a species at high risk to collision, with highest risk occurring during autumn due to increased movement related to their activity in the run-up to and during breeding. As of 2017, a total of five Verreauxs' Eagles collisions have been reported and four fatalities occurred at one wind farm within a three-month period. BirdLife (2017) caution that such preliminary data suggests that Verreauxs' Eagle is potentially vulnerable to collisions with overhead structures. Ralston-Paton *et al.* (2017) also reported Jackal Buzzard as the second most likely species to be involved in wind farm collisions. The large population size of this species led the authors to conclude that collisions are unlikely to have population-level impacts. A similar conclusion was made about Rock Kestrel, which was the fourth most common raptor to be involved in wind farm collisions. Corvids (crows and ravens) accounted for ~1% of recorded fatalities (these widespread species were recorded at the Franschhoek Skytram project area during the 12-month bird surveys.)

Internationally, there is a small body of literature for cable collision for ski-lifts and cableways, but raptors are not commonly reported. Gamebirds made up most of reported collisions (Bech *et al.*, 2012). Buffet and Dumont-Dayot (2013) reported similar findings with raptors making up less than 2% of collision in both the French Alps and French Pyrenees. Bevanger and Brøseth (2004) reported minor mortality of Rough–legged buzzards (*Buteo lagopus*) and Common Kestrel (*Falco tinnunculus*) strikes on a sub-alpine powerline in Norway.

Golden Eagles (*Aquila chrysaetos*) are a common resident in areas of Switzerland and Austria with high densities of cableways. The species is well studied and a good model animal for Verreaux's Eagle being closely related to this species, both in phylogeny and habitat, and its northern hemisphere ecological counterpart. A literature search did not return any records of this species impacting cables of cableways and cable cars, although annual collisions with wind farms are recorded for Golden Eagle (Tikkanen *et al.*, 2018).

Two cases of Bearded Vulture impacting cableway cables in the Swiss Alps have, however, been reported (Vulture Conservation Foundation, 2022) and cableway developments are considered a potential future threat to this species in South Africa (Krüger and Amar, 2022).

Information concerning the displacement of raptors by the building of infrastructure development on mountains, such as for the Franschhoek Skytram project, are scarce for both local and international studies. Most of the available literature mentioning raptor displacement are for wind farms (BirdLife South Africa, 2018, 2017; Ralston-Paton *et al.*, 2017; Tikkanen *et al.*, 2018; Watson *et al.*, 2018). Morán-López *et al.* (2017) and references within, found that larger raptor species were negatively affected by infrastructure development. A windfarm study by Dohm *et al.* (2019) found that the abundance of several raptor species recovered in years 7 and 8 of post-construction monitoring, while other raptor species appeared to have been permanently displaced. Such findings suggest that the construction and operational phases of new infrastructure development can displace raptors, but impacts may diminish over time for some species. Dohm *et al.'s* (2019) finding highlight the importance of assessing impacts over the operational life of a given development and the need for long-term monitoring to assess long-term impacts such as displacement on local raptor communities. Such long-term data is not available for Verreaux's Eagle. A 2017 report on impact assessment, monitoring and mitigation guidelines for Verreauxs' Eagle and wind farms (BirdLife South Africa, 2017) reports that as of 2017 there is no documented evidence of displacement for this species at any operational wind farm in South Africa. Surprisingly, preliminary evidence suggests that activity rates may increase post-construction, but the report highlights the need for further research and analysis to confirm this.

The best-case scenario we have for a potentially low likelihood of Verreaux's Eagle being impacted by a cableway comes from the Table Mountain Aerial Cableway. There was a well-known breeding pair of Verreaux's Eagles nesting in Blinkwater Gorge for the many decades, in the large gorge, close to the cableway. The proximity of this pair to the cableway for many decades without recorded incident would suggest the possibility that these individual and their offspring can see and actively avoid the cables and successfully co-exist with the cables and cable car. In addition, on 12 February 2023 Cape Town birder Garrett Skead observed and photographed an adult and juvenile Verreaux's Eagle soaring below the Table Mountain Aerial Cableway (Garret Skead pers. comm. to Callan Cohen). An established breeding pair of Verreaux's Eagle is also known from Walter Sisulu Botanical Gardens, suggesting that this species can possibly tolerate some degree of human activity and disturbance near its nesting site and that it can potentially become habituated to humans (BirdLife South Africa, 2017).

Another important aspect that appears to require consideration in cableway development is the design of the buildings associated with the top stations of cableways. Wellington Cable Car (New Zealand) top station building was designed with large glass windows/walls to maximise the view and experience of visitors to the cable car. Unfortunately, the terminal building bisects the flightpath between two important bird habitats resulting in high numbers of bird collisions (and deaths) with the glass walls. The glass walls/windows are invisible to birds and collisions occur when birds try to fly through the "reflections" of open space and greenery. Bird collisions with windows/glass walls of houses and multistorey buildings can be a significant negative impact and it is estimated that these account for over a billion bird fatalities annually in the United States (Brown *et al.*, 2021). Fortunately, there appears to be an effective solution to limit bird window strikes (https://www.urbanwildlifetrust.org/wellington-cable-car-bird-strike-prevention-project/; and see Brown *et al.*, (2021)).

12-Month Bird Flightpath Study

The vegetation type of the project Top Site (plateau of Middagskransberg) is intact Kogelberg Sandstone Fynbos, a vegetation type classed as Critically Endangered (CR) (SANBI, 2018; Skowno et al., 2019). The Study site consists of sandstone cliffs with a mostly pristine fynbos-covered scree slope. The Bottom site consists of two heavily disturbed Endangered vegetation types: Swartland Alluvium Fynbos and Boland Granite Fynbos (SANBI, 2018; Skowno et al., 2019) (Figure 2). The Franschhoek Skytram project area falls within one of South Africa's Important Bird Areas (IBA): Boland Mountains (Marnewick *et al.*, 2015).

A total of 49 bird species were recorded both during the site sensitivity visit (Colville *et al.*, 2022) and during the 12-month bird monitoring study (Appendix 6). Five of the SCC identified in the site sensitivity visit report were positively recorded in the project area (Table 1). These include the four ground-dwelling or rock-favouring species, and Verreaux's Eagle.

Fynbos Buttonquail, Cape Rockjumper, Sentinel Rock Thrush, and Ground Woodpecker were all recorded at the Top Site, and all but the buttonquail at the Slope Site (Table 1). It is suspected that Striped Flufftail inhabits the Top Site and possibly the Slope Site, but detection of this species is difficult. It is further suspected that Fynbos Buttonquail may occur on the Slope Site. The local population sizes at the Top Site are most likely small. The number of Buttonquail occurring on the Slope Site are unknown, but likely to be few, given the small area of suitable habitat.

Observations (Table 1 & 2) show that the Slope Site includes a locally important flight corridor for a small population of long-lived raptors, including Verreaux's Eagle. This flight corridor runs perpendicular to the proposed cable pathway and bisects it (Figures 1, 3 & 4). A cableway erected through this area therefore has the potential to create a bird collision hazard.

Figure 2. Haute Cabriere - A view of the proposed lower cable station from the bird observation position on Franschhoek Pass.

Figure 3. Main cliff face - A view of the main cliff face of Middagskransberg from Franschhoek Pass. Flight Corridors-1 are -2 are indicated (red lines).

Verreaux's Eagle was recorded in 70% of the surveys with a maximum of three birds (two adults and one immature) (Table 3). This species along with an additional seven species of raptor and corvid (crows and ravens) were recorded using at least one of three flight corridors (Table 2, Figure 1). Corridor-1 passes close to the Top Site, and possibly with Corridor-2 and -3 passing below the Cable (Figures 3 & 4). A combined total of 193 flights (Tables 1 & 2) were recorded along these

corridors, with Corridor-1 (n=95) and Corridor-2 (n=74) having the most activity. The percentage of flight paths that crossed the Cable was highest in Corridor-2 (78%) and Corridor-3 (92%), with only 2 flights crossing on Corridor-1. Verreaux's Eagles were recorded using Corridor-1 (n=12) and Corridor-2 (n=26), with 21 (55%) of these flights crossing the Cable.

Overall flight activity along the Flight Corridors at the Study Site was highest in April and May, and in August and December, with corresponding number of birds present (Table 2). Verreaux's Eagles showed a similar activity pattern but were absent in December. An adult pair of eagles was seen hunting together in February, April, and May 2022, presumably prior to the start of nesting. Single adults were observed each in July and August during the peak of breeding, as well as a post-breeding bird in November. Second year/immature birds were seen in March and July.

Figure 4. Cable layout - A view towards the area of the proposed cable layout (black line) from Franschhoek Pass. Flight Corridors-1 & -2 are indicated (red lines).

Table 1. Bird SCC recorded at the Top Site during the site sensitivity visit and 12-month bird survey study.

Species	Red data status (Regional/Global)1	Regional population size5	No. at Top Site	Presence at Top Site	Presence at Slope Site											
					F	M*	A	M	J	J	A	S*	O	N	D	F#
Striped Flufftail	VU/LC	1440-2150	Unknown	Suspected	-	*	-	-	-	-	-	*	-	-	-	-
Fynbos Buttonquail	LC/LC2,3	22248-88553	2	Confirmed	-	*	-	-	-	-	-	*	-	-	-	-
Verreaux's Eagle	VU/LC	<10000	Not resident	Confirmed4	Yes	*	Yes	Yes	Yes	Yes	Yes	*	Yes	Yes	No	No
Ground Woodpecker	Endemic/LC	Unknown	4	Confirmed	Yes	*	No	Yes	Yes	No	Yes	Yes	No	Yes	No	No
Cape Rockjumper	NT/NT	21700-39600	2	Confirmed	No	*	No	Yes	No	No	No	No	Yes	Yes	Yes	Yes
Sentinel Rock Thrush	Endemic/LC	Unknown	2	Confirmed	No	*	No	Yes	No	No	No	No	No	No	No	No

1 = Taylor, Peacock and Wanless (2015).
2 = Included as SCC based on national and global status of Endangered.
3 = Birdlife International 2022 status changed from Endangered to Least Concern based on new evidence.
4 = Recorded the species flying over the Top Site.
5 = South Africa, Lesotho and eSwatini.
* = Visibility was poor during the site visit.
# = this visit was made in the last week of January, first week of February 2023.
Conservation Status:
LC = Least Concern
VU = Vulnerable
NT = Near Threatened
E = Endangered

Table 2. Discrete raptor and corvid flights recorded during the Study Period (February 2022 – February 2023). The number of flights that crossed the Cable is presented with the total flights recorded per month. The largest number of individuals recorded during any visit during the Study Period is included. The minimum number of individuals seen are given in parenthesis.

Species	F	M	A	M	J	J	A	S	O	N	D	F#	Total
Species of Conservation Concern													
Verreaux's Eagle *Aquila verreauxii*	2/2 (2)	*	2/4 (2)	10/12 (3)	1/6 (1)	4/8 (1)	1/6 (1)	*	0/0	1/1 (1)	0/0	0/0	21/38
Other species													
Booted Eagle *Aquila pennatus*	0/0	*	0/0	0/0	0/0	0/0	0/0	*	0/0	0/0	0/1 (1)	0/0	0/1
Jackal Buzzard *Buteo rufofuscus*	0/0	*	0/3 (1)	2/3 (1)	0/1 (1)	1/1 (1)	0/1 (1)	*	0/0	0/0	1/1 (1)	0/0	4/10
Yellow-billed Kite *Milvus aegyptius*	0/0	*	0/0	0/0	0/0	0/0	0/0	*	0/0	0/0	2/2 (1)	1/1(1)	2/2
African Harrier-hawk *Polyboroides typus*	0/0	*	0/0	0/0	0/0	0/0	0/0	*	0/0	0/0	0/0	1/1(1)	1/1
Peregrine Falcon *Falco peregrinus*	0/1 (1)	*	0/2	0/0	0/0	0/0	0/3 (1)	*	0/0	0/0	1/3 (1)	0/0	1/9
Rock Kestrel *Falco rupicolus*	0/0	*	0/9 (2)	0/3 (1)	0/0	0/0	0/2 (1)	*	3/14 (2)	2/3 (1)	6/11 (2)	0/0	11/42
Pied Crow *Corvus albus*	0/0	*	0/11 (2)	4/8 (2)	0/0	0/0	0/0	*	0/0	0/0	0/0	0/0	4/19
White-necked *Corvus albicollis*	0/0	*	0/1 (1)	4/8 (2)	0/2 (2)	4/6 (2)	10/30 (3)	*	3/4 (1)	9/9 (2)	9/12 (3)	0/0	39/72
Total	**2/3**	*****	**2/30 (8)**	**20/34 (9)**	**1/8 (4)**	**9/15 (4)**	**11/42 (7)**	*****	**6/18 (3)**	**12/13 (4)**	**19/30 (9)**	**2/2(2)**	**82/193**

*Poor visibility made observations difficult.

= this visit was made in the last week of January, first week of February 2023

Table 3. Discrete raptor and corvid flights recorded during the Study Period (February 2022–February 2023) clustered by Flight Corridor. The number of flights that crossed the Cable is presented with the total flights recorded per month.

Species	Corridor 1	Corridor 2	Corridor 3	Total
Species of Conservation Concern				
Verreaux's Eagle *Aquila verreauxii*	1/12	20/26	0/0	21/38
Other species				
Booted Eagle *Aquila pennatus*	0/1	0/0	0/0	0/1
Jackal Buzzard *Buteo rufofuscus*	0/6	3/3	1/1	4/10
Yellow-billed Kite *Milvus aegyptius*	0/0	0/0	3/3	3/3
African Harrier-hawk *Polyboroides typus*	1/1	0/0	0/0	1/1
Peregrine Falcon *Falco peregrinus*	0/8	0/0	1/1	1/9
Rock Kestrel *Falco rupicolus*	0/22	8/16	¾	11/42
Pied Crow *Corvus albus*	0/15	4/4	0/0	4/19
White-necked *Corvus albicollis*	1/31	23/25	15/16	39/72
Total	**3/96**	**58/74**	**23/25**	**84/195**

Other Faunal SCC

In their site sensitivity assessment, Colville *et al.* (2022) highlighted several insect SCC that would have a high probability of occurring within the project area (Table 4). The Top Site represents intact and pristine fynbos habitat for all the insect SCC flagged, whereas the Bottom Site, because of its mostly disturbed and transformed nature, is unlikely to support important populations of any of the insect SCC. In addition, impacts at the Bottom Site should not have a significant effect on immediate local populations of insects, considering the large areas of natural vegetation to the north of the bottom site.

The habitat at the Top Site appears ideal for several Cape endemic butterfly species (Table 4), including having key habitat aspects essential for butterfly mating behaviour and larval life history requirements. These include hilltopping sites (important for mate-location behaviour), the presence of fynbos host plant species and host ant species, the latter a key component of the larval life cycle for many Cape endemic butterfly species. Hilltopping behaviour was noted by Colville *et al.* (2022) at several places near the Top Site during the site visit. At least ten Cape endemic butterfly species found in the mountains in and around Franschhoek, potentially could occur at the area earmarked for infrastructure development at the Top Site.

Colville *et al.* (2022) identified potentially highly sensitive aquatic habitat of importance for endemic frog, dragonfly, and damselfly species (Table 4) at the Top Site (Figure 6 & 7 in Colville, *et al.*, 2022), particularly areas falling across or close to the proposed access roads of the earlier proposed alternative. The two proposed alternatives do not include these access roads and therefore the primary concerns about this sensitive habitat and associated species have essentially fallen away. However, potential negative downstream impacts (e.g. disruption to stream flow, silt, and pollution run-off) from the Top Site infrastructure development should nonetheless still be considered.

Table 4. Insect and frog SCC flagged for the Franschhoek Skytram project area.

Species	Red data status (Regional)	Distribution	Probability at Top Site	Probability at Bottom Site
Katydids and Grasshoppers:				
Mute Winter Katydid (*Brinckiella aptera*)	Vulnerable B1ab(iii)	Occurs across WC Province	High	High
Peringuey's Meadow Katydid (*Conocephalus peringueyi*)	Vulnerable B1ab(i,ii,iii)+2ab(i,ii,iii)	Occurs across WC Province	High	High
Yellow-winged Agile Grasshopper (*Aneuryphymus montanus*)	Vulnerable B2ab (iii,v)	Occurs across WC Province in EC Province	High	High
Butterflies:				
Giant Copper (Aloeides pallida grandis)	Least Concern	Endemic to WC Province	High	Medium
Endymion Opal (*Chrysoritis endymion*)	Least Concern	Endemic to WC Province, at elevations above 1,200 m	Medium-High	Low
Dark Opal (*Chrysoritis nigricans nigricans*)	Least Concern	Endemic to WC Province	Medium-High	Medium
Holmes' Skolly (*Thestor holmesi*)	Least Concern	Endemic to WC Province	High	Low
Mountain Skolly (*Thestor montanus*)	Least Concern	Endemic to WC Province	High	Low
Hawequas Sky-blue Giant Cupid (*Lepidochrysops oreas junae*)	Least Concern	Endemic to WC Province	High	Low
Dickson-walsertjie (*Tsitana dicksoni*)	Least Concern	Endemic to WC Province	High	Medium
Damselflies and Dragonflies:				
Elusive Skimmer (*Orthetrum rubens*)	Vulnerable D2	Largely high mountains above Franschhoek	High	Low
Spesbona damselfly (*Spesbona angusta*),	Endangered B2ab(ii)	Main population is area running along the R45 between Franschhoek Pass and Theewaterskloof	High	Low
Rustic Presba (*Syncordulia serendipator*)	Endangered B1ab(iii)+2ab(iii)	Endemic to WC Province	Medium-High	Low
Guilded Presba (*Syncordulia legator*)	Vulnerable B2ab(iii)	Endemic to WC Province	Medium-High	Low
Yellow Presba (*Syncordulia gracilis*)	Vulnerable B2ab(i,ii,iii); D2	Endemic to WC and EC Provinces	Medium-High	Low
Mahogany Presba (*Syncordulia venator*)	Vulnerable B2ab(i,ii,iii)	Confined to the Cape Fold mountains	High	Low
Frog:				
Montane Marsh Frog (*Poyntonia paludicola*)	Near Threatened	Hottentots Holland, Kogelberg Mountain complex, and Klein River Mountains, and south-	High	Low

	east of Franschhoek Skytram project area

Assessments of Impacts

The various identified faunal impacts are assessed below for the different phases of the proposed development infrastructure for the Franschhoek Skytram project. Impacts are based on the plans as provided to date, and any changes to these or to the project would require a reassessment of impacts.

Bottom Site

From a faunal perspective, the impact of the proposed development for the Bottom Site is considered of low significance for all three insect SCC flagged. No bird SCC were flagged for the Bottom Site. The area is highly disturbed (man-made dam, wine estate and vineyards) and except for a small patch of natural vegetation around the small dam (Colville et al., 2022), offers limited habitat for any of the insect SCC.

One important aspect to consider is the effect of Artificial light at night (ALAN), which can potentially have long-term negative impacts on local insect fauna (Deichmann *et al.*, 2021; Owens *et al.*, 2020; Stewart, 2021). The two Katydids flagged for this project could potentially be most at risk from ALAN owing to its nocturnal habit. The impact of ALAN during the operational phase of the project should be considered, particularly as the development site abuts areas of natural vegetation to the north. Any additional outside lights that may be added as part of the new developments, could negatively impact on local insect faunas. There are several mitigation options to reduce the impact and attraction of artificial lights on insects (see Table below).

Overall, the impact significance during the different phases of the proposed development for both alternatives is considered low (-) for the Bottom Site, particularly when mitigation is considered. It should only have a small and localised impact on populations of the insect SCC and their long-term viability and persistence in the area. The use of artificial lights may extend the area of influence of the project site and mitigation measures should therefore be considered in this regard.

Impact tables for two katydid one grasshopper species

Fauna -- Insect SCC	Both Alternatives	No-Go Option
PLANNING, DESIGN AND DEVELOPMENT PHASE		
Potential impact and risk:		
Nature of impact:	Disturbance and habitat destruction associated with removal of natural vegetation. Loss of local populations of faunal SCC	Loss of local populations of insect SCC through possible continued land cultivation, pesticide drift from vineyards
Extent and duration of impact:	Local and Short term	Local and Long term
Consequence of impact or risk:	Loss of sub-populations of faunal SCC; Further fragmentation of sub-	Loss of sub-populations of faunal SCC; Further fragmentation of sub-

	populations of faunal SCC across fynbos habitats	populations of faunal SCC across fynbos habitats
Probability of occurrence:	Medium probability	Medium probability
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss	Marginal loss
Degree to which the impact can be reversed:	Partly reversible	Partly reversible
Indirect impacts:	Spread of invasive ant species (Argentine Ant *Linepithema humile*)	None identified
Cumulative impact prior to mitigation:	Low	Low
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low (-)	Low (-)
Degree to which the impact can be avoided:	Low-Moderate	Low-Moderate
Degree to which the impact can be managed:	Low-Moderate	Low-Moderate
Degree to which the impact can be mitigated:	Low-Moderate	Low-Moderate
Proposed mitigation:	• Clearing of natural vegetation should be prevented or kept to a minimum, especially around the dam. • Management and control of invasive alien ants in the restaurant, coffee shop, etc	• Any future clearing of natural vegetation should be prevented or kept to a minimum, especially around the dam
Residual impacts:	Low	Low
Cumulative impact post mitigation:	Low (-)	Low (-)
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low (-)	Low (-)
OPERATIONAL PHASE		
Potential impact and risk:		
Nature of impact:	Loss of sub-populations of faunal SCC; Further fragmentation of sub-populations of faunal SCC across fynbos habitats	Loss of local populations of insect SCC through possible continued land cultivation, pesticide drift from vineyards
Extent and duration of impact:	Local and Short term	Local and long term
Consequence of impact or risk:	Loss of sub-populations of faunal SCC; Further fragmentation of sub-populations of faunal SCC across fynbos habitats	Loss of sub-populations of faunal SCC; Further fragmentation of sub-populations of faunal SCC across fynbos habitats

Probability of occurrence:	Medium probability	Medium probability
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss	Marginal loss
Degree to which the impact can be reversed:	Partly reversible	Partly reversible
Indirect impacts:	Spread of invasive ant species (Argentine Ant *Linepithema humile*). [This invasive ant species has the potential to displace local fynbos ant species important as butterfly hosts and as seed dispersers for fynbos plants (Buczkowski and Wossler, 2019)]	None identified
Cumulative impact prior to mitigation:	Low	Low
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low (-)	Low (-)
Degree to which the impact can be avoided:	Low-Moderate	Low-Moderate
Degree to which the impact can be managed:	Low-Moderate	Low-Moderate
Degree to which the impact can be mitigated:	Low-Moderate	Low-Moderate
Proposed mitigation:	• Fixtures on lights to cover the light bulb and direct the light to where it is needed. • Use timers and sensors to control when lights are on and to make lights motion activated. • Use coloured lights, such as long wavelength amber and red lights. Yellow illumination lights have also been shown to attract less moth specimens (Verovnik, Fišer and Zakšek, 2015). ; Deichmann *et al.*, (2021) recommend filtered amber LED lamps with no blue and minimal green light content to be used for outdoor lighted areas. • An outdoor lighting plan should be developed that includes an overall reduction of nocturnal lighting. Management and control of invasive alien ants in the restaurant, coffee shop, etc.	Same as for both alternatives

Residual impacts:	Low	Low
Cumulative impact post mitigation:	Low (-)	Low (-)
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low (-)	Low (-)

Top Site

For both alternatives, after mitigation, the impact is considered low-medium significance for the insect SCC flagged, low for the frog SSC, and low-medium for the bird SCC. The area is pristine undisturbed fynbos habitat and offers excellent habitat for the insect SCC and ground-dwelling bird SCC (Cape Rockjumper, Sentinel Rock Thrush, Ground Woodpecker, Striped Flufftail, and Fynbos Buttonquail). However, main areas of development of the Top Station (cable station, shops, restaurant, walkways, etc.) will be mostly concentrated within the western side of the Top Site and will have a small footprint (~0.5 ha). The habitat found at the area for proposed development at the Top Site is ubiquitous and abundant to the immediate north, south and east, with extensive areas of natural fynbos habitat.

There is little published data on the effects of human disturbance on the five bird SCC occurring at the Top Site. It can be assumed that there will be local extirpation/displacement of the small breeding populations of these species during the immediate construction phase. The local populations of Ground Woodpeckers, Cape Rockjumpers and Sentinel Rock Thrushes will be most affected. The effect of Fynbos Buttonquail and Striped Flufftail will probably be less immediate as they occur further away from the proposed Upper Cable Station, but will be affected during the construction of walking decks, pathways, and hiking trails. If these extirpations/ displacements are permanent, the loss of the small numbers of ground-dwelling bird SCC at the Top Site are unlikely to have species level impacts and are unlikely to cause any significant local population decreases.

Post-construction, there is a strong possibility for the return of both Cape Rockjumper and Sentinel Rock Thrush to the Top Site. These species and their sister species are known to become habituated in areas of persistent human presence. Cape Rockjumpers are known to frequent heavily used areas of the Cape Fold Mountains (e.g. Bains Kloof Village and the Wolfberg Arches in the Cederberg (per obs.)). Similarly, the Drakensberg Rockjumper (*Chaetops aurantius*) is found around tourist areas like Sani Pass (pers obs). Ground Woodpeckers are known to be sensitive to areas of human disturbance but can occur close to human settlements, e.g. population in Rooi Els (Hockey, Dean and Ryan, 2005; pers. obs.). Both Fynbos Buttonquail and Striped Flufftail are very secretive and are likely to be most impacted by development. Both species, however, occur close to heavily used hiking trails on the Steenberg Plateau and around St James Peak in Table Mountain National Park (pers. obs.).

Important and potentially sensitive habitat of the Top Site is associated with the area that the cableway cables will fall across and that will bisect the flight corridors for Verreaux's Eagle. Based on observations from the existing cableway on Table Mountain and available data for eagle collisions with windfarms and electrical wires from South Africa and international studies, large raptors appear at low risk for cable collisions. It is worth noting that the species does not nest nearby, and the nearest nest is ~7.6 km away.

Verreaux's Eagle is a highly charismatic, highly visible, and high-profile conservation species. Based on a decline in reporting rates, population numbers in South Africa appear to be decreasing and introducing new human-made risks into their habitat should be minimised were possible (BirdLife South Africa, 2017). Therefore, mitigation measures to reduce the risk of cable collisions from the proposed Franschhoek Skytram must be adopted, and it is essential that an extended monitoring programme be undertaken that should start at and continue through the construction phase and extend to the operational phase for a period of three years. This would help ascertain if the species is displaced during the planning, design, and development phase and if it returns during the operational phase. Monitoring will also be able to detect cable collisions. The use of a helicopter to ferry construction material and personal to the top site during the construction phase could potentially disturb and displace Verreaux's Eagle, and other raptor or cliff-soaring birds, from flight corridors, at least for the short-term. However, this would not affect their breeding, only part of their foraging area. The planned paragliding launching area and associated paragliding activity may further contribute to disturbance of raptor or cliff-soaring birds and this proposed activity reiterates the need for an extended monitoring programme.

One important indirect impact to consider for insect SCC is the effect of Artificial light at night (ALAN), which can potentially have long-term negative impacts on local insect fauna (Deichmann *et al.*, 2021; Owens *et al.*, 2020; Stewart, 2021). This aspect is of high consideration for the Top Site as the Top Site is surrounded by natural vegetation with currently no ALAN. The two Katydid SCC flagged for this project could potentially be most at risk from ALAN owing to their nocturnal habit, as would many other night-flying insect species. The impact of ALAN during the operational phase of the project would extend the area of influence of the Top Site and mitigation measures should therefore be considered in this regard. There are several mitigation options to reduce the impact and attraction of artificial lights on insects (see Impact Tables).

Overall, the impact significance for the insect and ground-dwelling bird SCC during the construction and operational phase is therefore considered low-medium, and low when mitigation is considered. It should only have a small and localised impact on populations of the insect and ground-dwelling bird SCC and their long-term viability and persistence in the area. Cable collision risks for Verreaux's eagle are considered low with mitigation, but an extended monitoring programme is required. The post construction monitoring may also help to better inform on the impacts of similar infrastructure projects on local raptor populations.

A)

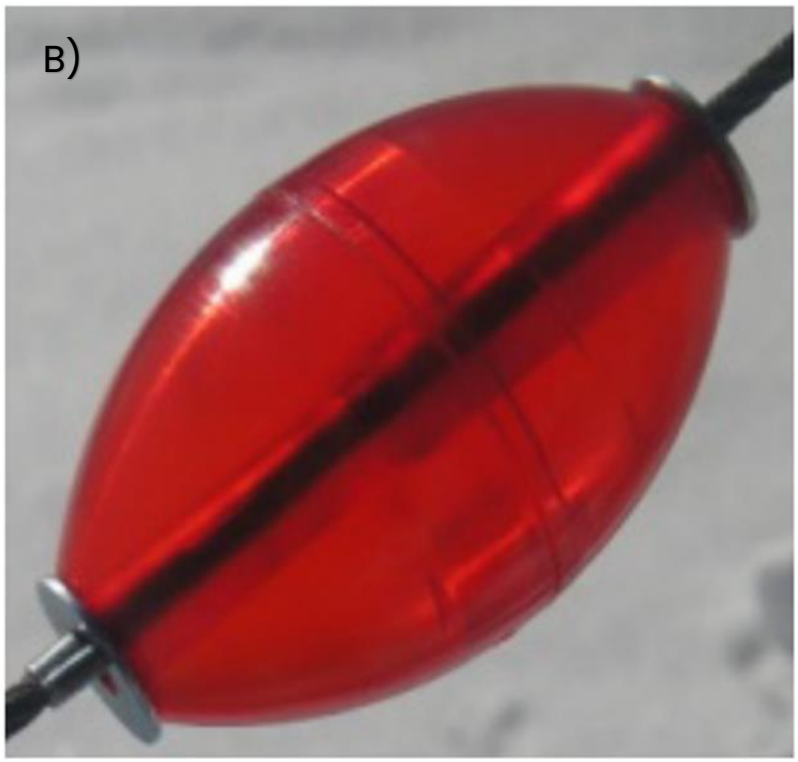
B)

Figure 5(A-C). Examples of bird diverters/markers to be installed on cables (from Buffet and Dumont--Dayot, 2013): A - coiled PVC tubing; ; B - floaters; and C - checkered flags and red paint lines on cables.

Impact tables for insect SCC

Fauna -- Insect SCC	Both Alternatives	No-Go Option
PLANNING, DESIGN AND DEVELOPMENT PHASE		
Potential impact and risk:		
Nature of impact:	Disturbance and habitat destruction of aquatic habitat through possible pollution run-off downstream and altering of stream run-off to downstream aquatic habitats. Loss of local populations of faunal SCC.	The status quo will be maintained for the natural fynbos and aquatic habitat
Extent and duration of impact:	Local and Short term	Local and Long term
Consequence of impact or risk:	Loss of sub-populations of faunal SCC; Further fragmentation of sub-populations of faunal SCC across fynbos habitats	Protection and conservation of sub-populations of faunal SCC across fynbos habitats
Probability of occurrence:	Low-Medium probability	High probability
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss	No loss
Degree to which the impact can be reversed:	Partly reversible	N/A

Indirect impacts:	Pollution run-off downstream and altering of stream flow downstream Spread of invasive ant species (Argentine Ant *Linepithema humile*). [This invasive ant species has the potential to displace local fynbos ant species important as butterfly larval hosts and as seed dispersers for fynbos plants (Buczkowski and Wossler, 2019)	N/A
Cumulative impact prior to mitigation:	Medium	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium (-)	High (+)
Degree to which the impact can be avoided:	Low-Moderate	N/A
Degree to which the impact can be managed:	Low-Moderate	N/A
Degree to which the impact can be mitigated:	Low-Moderate	N/A
Proposed mitigation:	• Aquatic habitat classed as highly sensitive and no-go areas with appropriate buffers. • Ensure no pollution run-off downstream into low-lying aquatic habitats. • Clearing of natural vegetation should be prevented or kept to a minimum. • Management and control of invasive alien ants in the restaurant, coffee shop, etc.	N/A
Residual impacts:	Low	N/A
Cumulative impact post mitigation:	Low-Medium (-)	N/A
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low-Medium (-)	N/A
OPERATIONAL PHASE		
Potential impact and risk:		
Nature of impact:	Disturbance of sensitive aquatic habitat (e.g. pollution, altered stream, run-off).	The status quo will be maintained for the natural fynbos and aquatic habitat

	ALAN causing deaths and decrease in local abundance of night flying insects.	
Extent and duration of impact:	Local and Short term	Local and Long term
Consequence of impact or risk:	Loss of sub-populations of faunal SCC; Further fragmentation of sub-populations of faunal SCC across fynbos habitats	Protection and conservation of sub-populations of faunal SCC across fynbos habitats
Probability of occurrence:	Low-Medium probability	High probability
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss	No loss
Degree to which the impact can be reversed:	Partly reversible	N/A
Indirect impacts:	ALAN causing deaths and decrease in local abundance of insects. Spread of invasive ant species (Argentine Ant *Linepithema humile*). [This invasive ant species has the potential to displace local fynbos ant species important as butterfly larval hosts and as seed dispersers for fynbos plants (Buczkowski and Wossler, 2019).	N/A
Cumulative impact prior to mitigation:	Medium	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium (-)	High (+)
Degree to which the impact can be avoided:	Low-Moderate	N/A
Degree to which the impact can be managed:	Low-Moderate	N/A
Degree to which the impact can be mitigated:	Low-Moderate	N/A
Proposed mitigation:	• Aquatic habitat classed as highly sensitive and no-go areas with appropriate buffers. • Ensure no pollution run-off downstream into low-lying aquatic habitats. • Fixtures on lights to cover the light bulb and direct the light to where it is needed. • Use timers and sensors to control when lights are on and to make lights motion activated. • Use coloured lights,	• Monitoring and control of alien plant species.

	such as long wavelength amber and red lights. Yellow illumination lights have also been shown to attract less moth specimens (Verovnik, Fišer and Zakšek, 2015). ; Deichmann *et al.*, (2021) recommend filtered amber LED lamps with no blue and minimal green light content to be used for outdoor lighted areas. • An outdoor lighting plan should be developed that includes an overall reduction of nocturnal lighting. • Management and control of invasive alien ants in the restaurant, coffee shop, etc.	
Residual impacts:	Low	N/A
Cumulative impact post mitigation:	Low (-)	N/A
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low (-)	N/A

Impact tables for Frog SCC

Fauna -- Frog SCC	Both Alternatives	No-Go Option
PLANNING, DESIGN AND DEVELOPMENT PHASE		
Potential impact and risk:		
Nature of impact:	Disturbance and habitat destruction through possible pollution run-off downstream from Top Site and altering of stream run-off to downstream aquatic habitats. Loss of local populations of faunal SCC	The status quo will be maintained for the natural fynbos aquatic habitat
Extent and duration of impact:	Local and Short term	Local and Long term
Consequence of impact or risk:	Loss of sub-populations and further fragmentation of sub-populations across fynbos habitats	Protection and conservation of sub-populations of faunal SCC across aquatic fynbos habitats
Probability of occurrence:	Low-Medium probability	High probability
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss	No loss

Degree to which the impact can be reversed:	Partly reversible	N/A
Indirect impacts:	None identified	N/A
Cumulative impact prior to mitigation:	Medium	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium (-)	High (+)
Degree to which the impact can be avoided:	Moderate	N/A
Degree to which the impact can be managed:	Moderate	N/A
Degree to which the impact can be mitigated:	Low-Moderate	N/A
Proposed mitigation:	• Aquatic habitat classed as highly sensitive and no-go areas with appropriate buffers. • Ensure no pollution run-off downstream into low-lying aquatic habitats. • Clearing of natural vegetation should be prevented or kept to a minimum.	
Residual impacts:	Low	N/A
Cumulative impact post mitigation:	Low (-)	N/A
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low (-)	N/A
OPERATIONAL PHASE		
Potential impact and risk:		
Nature of impact:	Disturbance of sensitive aquatic habitat (e.g. pollution, altered stream, run-off from Top Site). Loss of local populations of faunal SCC	The status quo will be maintained for the natural fynbos habitat
Extent and duration of impact:	Local and Short term	Local and Long term
Consequence of impact or risk:	Loss of sub-populations of frog SCC; Further fragmentation of sub-populations of frog SCC across fynbos habitats	Protection and conservation of sub-populations of frog SCC across fynbos habitats
Probability of occurrence:	Low-Medium probability	High probability
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss	No loss

Degree to which the impact can be reversed:	Partly reversible	N/A
Indirect impacts:	None identified	N/A
Cumulative impact prior to mitigation:	Medium	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium (-)	High (+)
Degree to which the impact can be avoided:	Low-Moderate	N/A
Degree to which the impact can be managed:	Low-Moderate	N/A
Degree to which the impact can be mitigated:	Low-Moderate	N/A
Proposed mitigation:	• Ensure no pollution run-off downstream from Top Site into low-lying aquatic habitats. • Clearing of natural vegetation should be prevented or kept to a minimum.	• Monitoring and control of alien plant species.
Residual impacts:	Low	N/A
Cumulative impact post mitigation:	Low (-)	N/A
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low (-)	N/A

Impact tables for ground-dwelling bird SCC

Fauna -- ground-dwelling bird SCC	**Both Alternatives**	**No-Go Option**
PLANNING, DESIGN AND DEVELOPMENT PHASE		
Potential impact and risk:		
Nature of impact:	Disturbance and habitat destruction associated with removal of natural vegetation. Loss of local populations of faunal SCC	The status quo will be maintained for the natural fynbos habitat
Extent and duration of impact:	Local and Short term	Local and Long term
Consequence of impact or risk:	Loss of sub-populations of faunal SCC; Further fragmentation of sub-populations of faunal SCC across fynbos habitats.	Protection and conservation of sub-populations of faunal SCC across fynbos habitats

	Disturbance to birds roosting and breeding on the cliff face from placing cables and cable station. During the construction stage, machinery and personnel may cause disturbance through both physical presence and noise.	
Probability of occurrence:	Medium probability	High probability
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss	No loss
Degree to which the impact can be reversed:	Partly reversible	N/A
Indirect impacts:	None identified	N/A
Cumulative impact prior to mitigation:	Medium	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium (-)	High (+)
Degree to which the impact can be avoided:	Low-Moderate	N/A
Degree to which the impact can be managed:	Low-Moderate	N/A
Degree to which the impact can be mitigated:	Low-Moderate	N/A
Proposed mitigation:	• Clearing of natural vegetation and rocky habitat should be prevented or kept to a minimum. • On-site demarcation of 'no-go' areas • All construction staff and vehicles should adhere to clearly defined and demarcated pathways and roads. • No walking through the veld or off-road driving to be allowed outside of the construction area.	N/A
Residual impacts:	Low	N/A
Cumulative impact post mitigation:	Low-Medium (-)	N/A
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low-Medium (-)	N/A
OPERATIONAL PHASE		

Potential impact and risk:		
Nature of impact:	Loss of sub-populations of faunal SCC; Further fragmentation of sub-populations of faunal SCC across fynbos habitats	The status quo will be maintained for the natural fynbos habitat
Extent and duration of impact:	Local and Short term	Local and Long term
Consequence of impact or risk:	Loss of sub-populations of faunal SCC; Further fragmentation of sub-populations of faunal SCC across fynbos habitats. During the operational stage, the numbers of visitors to the Top Site will increase and the numbers of people using routes such as the walkways and hiking paths are also likely to increase. This poses the risk of adverse effects on bird habitats due to trampling of vegetation and long-term exposure to disturbance impacts. Such impacts may lead to adverse effects on ground-dwelling species,	Protection and conservation of sub-populations of bird SCC across fynbos habitats
Probability of occurrence:	Low-Medium probability	High probability
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss	No loss
Degree to which the impact can be reversed:	Partly reversible	N/A
Indirect impacts:	None identified	N/A
Cumulative impact prior to mitigation:	Medium	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium (-)	High (+)
Degree to which the impact can be avoided:	Low-Moderate	N/A
Degree to which the impact can be managed:	Low-Moderate	N/A
Degree to which the impact can be mitigated:	Low-Moderate	N/A
Proposed mitigation:	• Clearly marked pathways and signs to ensure visitors do not walk through the veld.	• Monitoring and control of alien plant species.
Residual impacts:	Low	N/A
Cumulative impact post mitigation:	Low (-)	N/A

Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low (-)	N/A

Impact tables for Verreaux's Eagle

Fauna -- Verreaux's Eagle	**Both Alternatives**	**No-Go Option**
PLANNING, DESIGN AND DEVELOPMENT PHASE		
Potential impact and risk:		
Nature of impact:	Disturbance, cable risk collision (injury, death), and displacement	The status quo will be maintained for the natural fynbos mountain habitat and flight corridors.
Extent and duration of impact:	Local. Unknown, possibly permanent	Reginal and Long term
Consequence of impact or risk:	Cable collisions can cause injuries and death. During the construction stage, helicopter, machinery, and personnel may cause disturbance and displacement through both physical presence and noise.	Probable protection and conservation of sub-populations of faunal SCC across fynbos habitats
Probability of occurrence:	Low probability	High probability
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss	No loss
Degree to which the impact can be reversed:	Partly reversible	N/A
Indirect impacts:	None identified. (see mitigation below)	N/A
Cumulative impact prior to mitigation:	Medium	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium (-)	High (+)
Degree to which the impact can be avoided:	Low-Moderate	N/A
Degree to which the impact can be managed:	Low-Moderate	N/A
Degree to which the impact can be mitigated:	Low-Moderate	N/A
Proposed mitigation:	• No construction activity should occur near active raptor nests	N/A

	should these be discovered prior to or during the construction phase; BirdLife South Africa (2017) recommends a 3 km buffer around nest sites. • A pre-construction survey of the cableway path should be done to identify areas of avifaunal sensitivity such as raptor nests in the proximity of the line route. • Cable alignment for the five cables should potentially follow the Table Mountain Aerial Cableway alignment. • Clearing of natural vegetation and clearing/disturbance of cliff face habitat should be prevented or kept to a minimum. • The helicopter flight path for ferrying personal and construction material/equipment should avoid and not cross the cliff face. • Any temporary and permanent cables/wires/ropes erected over the cliff face should have bird collision diverters (floaters, PVC coiled tubing, checkered flags or red paint lines as means of highlighting cables – see Buffet and Dumont--Dayot, 2013 and Bernardino *et al.*, 2018). • BirdLife South Africa (2017) recommend that steps should be taken to ensure that any of Verreauxs' Eagle's primary prey (e.g. rock hyrax) does not become more abundant because of construction, by ensuring that excavated rocks are removed from site, and any animal carcasses found on site are removed. Similarly, any landscaping of rockeries at the Top Site should not create additional rock hyrax habitat. "No-Feeding" signs must also be placed to discourse human feeding of	

	dassies. Attempts to actively manage prey should, however, be carefully considered and the secondary environmental costs of prey management should always be considered.	
Residual impacts:	Low	N/A
Cumulative impact post mitigation:	Medium (-)	N/A
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low-Medium (-)	N/A
OPERATIONAL PHASE		
Potential impact and risk:		
Nature of impact:	Disturbance, cable risk collision (injury, death), and displacement.	The status quo will be maintained for the natural fynbos habitat
Extent and duration of impact:	Local. Unknown, possible permanent.	Local and Long term
Consequence of impact or risk:	Cable collisions can cause injuries and death. Disturbance to birds roosting and breeding on the cliff face from cable car and high visitor traffic (physical presence and noise).	Protection and conservation of sub-populations of frog SCC across fynbos habitats
Probability of occurrence:	Low	High probability
Degree to which the impact may cause irreplaceable loss of resources:	marginal loss	No loss
Degree to which the impact can be reversed:	Irreversible	N/A
Indirect impacts:	None identified	N/A
Cumulative impact prior to mitigation:	Medium	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium (-)	High (+)
Degree to which the impact can be avoided:	Low-Moderate	N/A
Degree to which the impact can be managed:	Low-Moderate	N/A
Degree to which the impact can be mitigated:	Low-Moderate	N/A
Proposed mitigation:	• Cables must have bird collision diverters (floaters,	Monitoring and control of alien plant species.

	PVC coiled tubing, checkered flags and/or red paint lines as means of highlighting cables – see Buffet and Dumont--Dayot, 2013 and Bernardino *et al.*, 2018). • Initiate an extended monitoring programme (See EMPr table below) to collect pre- and post-construction monitoring data to inform an adaptive management type-approach to manage unforeseen negative impacts. • Routine maintenance procedures on the cables and cable car should be undertaken in the early morning before eagle flight activity starts.	
Residual impacts:	Low	N/A
Cumulative impact post mitigation:	Medium (-)	N/A
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low-Medium (-)	N/A

Impact tables for bird collision with glass walls and windows

This impact is essentially applicable at the Operational Phase, but installation of bird-friendly glass should be undertaken at the construction phase.

Fauna – A range of bird species	**Both Alternatives**	**No-Go Option**
OPERATIONAL PHASE		
Potential impact and risk:		
Nature of impact:	Collision (injury, death) with glass windows and walls.	The status quo will be maintained for the natural fynbos habitat

Extent and duration of impact:	Local and Long term	Local and Long term
Consequence of impact or risk:	Collisions can cause injuries and death, loss of local populations.	Protection and conservation of sub-populations of frog SCC across fynbos habitats
Probability of occurrence:	Medium probability	High probability
Degree to which the impact may cause irreplaceable loss of resources:	Marginal loss	No loss
Degree to which the impact can be reversed:	Partly reversible	N/A
Indirect impacts:	None identified	N/A
Cumulative impact prior to mitigation:	Medium - High	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium (-)	High (+)
Degree to which the impact can be avoided:	Moderate	N/A
Degree to which the impact can be managed:	Moderate	N/A
Degree to which the impact can be mitigated:	Moderate	N/A
Proposed mitigation:	• Installation of Bird-Safe Window Marker Guidelines: • https://flap.org/stop-birds-from-hitting-windows/ • https://www.featherfriendly.com/	Monitoring and control of alien plant species.
Residual impacts:	Low	N/A
Cumulative impact post mitigation:	Medium (-)	N/A
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low (-)	N/A

Cumulative Impacts

Although the development is considered of low-medium significance for the faunal SCC, it may become more significant if added to existing or future impacts from other activities in the area. Loss of mountain fynbos habitat associated with Kogelberg Sandstone Fynbos is considered of high conservation concern: less than 40% of this vegetation remains (Skowno et al., 2019). The proposed development will therefore occur in a broader area within a mosaic of vegetation and habitat that is highly fragmented and disturbed. In addition, the proposed development falls within an Important Bird Area (IBA): Boland Mountains.

Potential cumulative impacts for Verreauxs' Eagle in the Western Cape have been reported as an on-going concern due to the increase in potential habitat loss, displacement, disturbance, and collision risks from new infrastructural developments associated with wind farms (BirdLife South Africa, 2017). However, because of the low likelihood of cable collision and habitat displacement, it is considered that the cumulative impacts for the Franschhoek Skytram project will result in minor cumulative effects (medium).

Currently, it seems unlikely that the addition of the proposed developments of either alternative will contribute to a cumulative negative impact on the long-term viability of any of the populations of the insect or ground-dwelling bird SCC and their persistence.

Similarly, if the cableway cables and cable car do not disturb or create a collision risk, then as for Table Mountain, the Franschhoek Skytram is unlikely to contribute to a cumulative negative impact for Verreauxs' Eagle. Mitigation measures should further reduce any cumulative negative impacts for all faunal SCC. The remaining area of the Top Site and surrounding municipal area should ideally be incorporated into CapeNature's protected areas and stewardship programme.

Impact Statement

The proposed Franschhoek Skytram development is unlikely to generate significant negative impacts on any of the faunal SCC flagged for this project once mitigation is followed. It is the three specialists' opinion that the proposed development will have an overall low-medium significance (small to moderate negative effects) on the faunal SCC flagged and therefore the proposed development can be approved in terms of the specific theme of this terrestrial animal species assessment: largely on the condition that all mitigation measures are implemented including an extended bird monitoring programme to be undertaken, starting at and continuing through the construction phase and extending to the operational phase for a period of three years.

Activities for Inclusion in draft EMPr

Planning, design, and development phase – Alternative (preferred)				
Potential Impact	**Objective**	**Action**	**Frequency**	**Responsible Party**
Insect SCC:			On-going	Contractor

• Disturbance and habitat destruction of natural fynbos habitat, including aquatic habitat.	• Low footprint and low impact on insect SCC and their habitats	• On-site demarcation of 'no-go' areas, such as areas falling outside the immediate construction areas. • Follow recommendations of Freshwater Specialist for aquatic habitats		ECO
Bird SCC: Bird habitat loss destruction, disturbance, and displacement. Loss of bird SCC.	Low footprint and low impact on bird SCC habitats Low disturbance of birds during construction Prevention of bird collisions with cableway cables and glass windows/walls	• On-site demarcation of 'no-go' areas. These areas should be identified during pre-construction monitoring. • A walk-through by an appointed avifauna specialist prior to the construction commencing, to confirm the location and status of bird nests, particularly on the cliff face. • Bird markers placed on any overhead ropes/wires/cables falling across the cliff face. • The instillation of Feather Friendly®bird deterrent markers, or similar, on windows and glass walls. • An extended bird monitoring programme should be undertaken including the construction phase, to monitor bird movements and collisions.	On-going	• Contractor/Engineer • Appointed ornithologist • ECO
Operational phase – Alternative (preferred)				
Potential Impact	**Objective**	**Action**	**Frequency**	**Responsible Party**
Insect SCC: • Disturbance of natural fynbos habitat, including aquatic habitat. • ALAN causing deaths and	• Low impact on insect SCC and their habitats.	• Installation of an appropriate outdoor lighting plan to minimise insect attraction. • Pest management and control of invasive alien ants in the restaurant, coffee shop, etc.	• On-going	• Contractor/Engineer • ECO • Project Developer

decrease in local abundance of nocturnal insects. • Spread of invasive ant species (Argentine Ant *Linepithema humile*).				
Bird SCC: • Displacement and bird collisions	• Monitor bird species occurrence and movements across flight corridors. • Monitor bird injuries and fatalities for both the cable and glass windows/walls of the top station buildings.	• Installation of bird markers on cables, these are to be regularly checked and replaced and/or re-painted. • Monitor, using the same methodology as for the 12-month bird survey undertaken as part of this impact assessment, bird species occurrences and flight corridors for a period of 3 years as recommended by BirdLifeSA. • Monitor and record collision incidence and investigate appropriate mitigation measures, as required. • Maintenance activities related to the cableway and cables should be scheduled to avoid disturbances to raptors using the cliff face, particularly during breeding seasons.	• On-going • Minimum of 3 years. • On-going • On-going	• Contractor/Engineer • ECO • Avifaunal Specialist • Avifaunal Specialist • Operations and maintenance contractor • ECO • Operations and maintenance contractor • ECO
Bat SCC: • Injuries and deaths due to bats roosting within the machinery of the cable car. [Discussion with a bat specialist suggests that although the	• Check for bats roosting in cableway machinery	• Contact Bat specialist for removal of bats (e.g. http://www.sabaa.org.za/; EkoVler Environmental Management/ Bat Impact Assessments)	On-going	• Operations and maintenance contractor • ECO

potential for this impact is low, the operator of the cable car should be always aware of this issue].				

Acknowledgments

Megan Mergatroyd, Lucia Rodrigues and Petra Sumasgutner are thanked for discussions regarding Verreaux's and Golden Eagles. Stephanie Dippenaar (EkoVler Environmental Management/Bat Impact Assessments) is thanked for expert opinion regarding bats. CapeNature is thanked for collecting permits: CN44-87-20545 and CN44-59-13497.

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Appendix-1 – CV Jonathan Colville

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.
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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.
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- 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.
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- 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 Animal Species Specialist Assessment. Grace Rock Equestrian Farm. Prepared for Delta Ecology and Legacy Environmental Management Consulting.
- **Colville, J.F.**, and Cohen, C. (2022). Terrestrial Animal Species Specialist Assessment. Dana Bay Access Road. Prepared for Sharples Environmental Services cc (SES).
- **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).

Appendix-2 – Cv Callan Cohen

ABRIDGED CURRICULUM VITAE DR CALLAN COHEN

Education

PhD in Ornithology (Zoology), University of Cape Town, 2011.

Positions held:

Director: Birding Africa. 1997 – present.

Research Associate: FitzPatrick Institute of African Ornithology, Department of Biological Sciences, University of Cape Town. 2012 – present.

Experience

Acknowledged expert on African birds, based on over 1000 field trips, research studies and surveys from 1990 to present, in over 25 African countries, but focused largely across South Africa. First author of 2 books on African birds, and contributor to almost 10 others. Also publications and reports on Odonata, Lepidoptera, Herpetology and Botany.

Selected Books

Cohen, C., Spottiswoode, C. & Rossouw, J. 2006. **Southern African Birdfinder: where to find 1400 species in southern Africa and Madagascar**. Cape Town: Struik New Holland Publishers, 456 pp. Reprinted 2007, 2012, 2022.

Cohen, C. & Spottiswoode, C. 2000. **Essential Birding in Western South Africa: Key routes from Cape Town to the Kalahari.** Cape Town: Struik New Holland Publishers, 136 pp. Reprinted 2001.

Klaas-Douwe B. Dijkstra & **Callan Cohen**. 2021. **Dragonflies and Damselflies of Madagascar and the western Indian Ocean Islands**. Association Vahatra Antananarivo, Madagascar. 198 pages.

Contributed 20 species accounts in: Harrison, J.A., Allan, D.G., Underhill, L.G., Herremans, M., Tree, A.J., Parker, V. & Brown, C.J. (Eds). 1997. **The Atlas of Southern African Birds**. Johannesburg: BirdLife South Africa.

Contributed 10 species accounts in: Hockey, P.A.R., Dean, W.R.J. & Ryan, P.G. (Eds). 2005. **Roberts' Birds of Southern Africa**. Seventh edition. Cape Town: John Voelcker Bird Book Fund.

Contributor to Red Data Book on Birds: BARNES, K.N. (ed.) 2000. **Threatened Birds of South Africa, Lesotho and Swaziland**. Johannesburg: BirdLife South Africa.

Species account written: African Marsh Harrier

Other Publications

About 100 journal articles and over 50 reports, e.g. most recent:

Cohen, C. 2021. **Deciphering South Africa's first Crested Honey Buzzard**. African Birdlife 9(4): 26-29.

Cohen, C., N. J. Collar, A. Dagnee, L. D. C. Fishpool, S. J. Marsden, C. N. Spottiswoode & S. R. Wotton. 2021. **Status of Taita Falcon Falco fasciinucha in Ethiopia and the identification problem posed by African Hobby F. cuvierii**. Bull ABC Vol 28 No 2: 225-233

Mills, Michael S. L., Julian Francis, Nik Borrow, Nigel Redman, Washington Wachira and **Callan Cohen**. 2021. **English bird names in common use: a framework to achieve a stable world list despite ongoing taxonomic changes, and a call to establish a broad-based African Bird Names Committee.** Bull ABC Vol 28 No 1: 93-98.

Appendix-3 – CV Vincent Ward

VINCENT L WARD -- ABRIDGED CURRICULUM VITAE

Tokai, Cape Town, Western Cape

birdingafricavincent@gmail.com

+27 (0) 62 667 4361

Education and Qualifications

BSc Zoology, *University of South Africa*, 2002

Nature Guide NQF2, *The Nature College*, 2016

Experience

1996 – 2007: **Research Ornithologist**, *Western Cape Nature Conservation, Cape Town*

Coastal seabird demography work; monitoring of West Coast estuaries; seabird counts, seabird ringing, marine mammal surveys; data collection and reporting; liaison with the public; assistant tourism development manager

Dec/Jan 2001: **Field Assistant** *Marion Island 2001 Summer Survey*

Four-week research expedition to Marion Island to census seabirds across the island; data collection

2007 – 2013: **Commercial Recycling Project Manager,** *Commercial Recycling Solutions, San Francisco, USA*

Design and implementation of large-scale recycling systems for hotels and convention centres

2013 – 2016: **Wind and Solar Farm Surveys**, *Tony Williams Bird Surveys, Cape Town*

Avian EIA projects in Karoo and Kalahari habitats; observer (flight paths and bird atlassing) and assistant report writer for one solar and three wind farm projects

2017 – Present: **Senior Tour Leader,** *Birding Africa/Cape Town Pelagics, Cape Town*

Leading specialist birding tours across South Africa; Western Cape and Pelagic seabird specialist

July/Aug 2019: **Seabird Team Leader** *Southern Ocean Large Scale Experiment (SCALE)*

Three-week research expedition to Antarctica; at-sea transects of birds; data collation, curation and reporting.

Jan 2022: **Guide, Flock to Marion Island**, *Birdlife South Africa*

One week cruise to the sub-Antarctic Prince Edward Islands; one of 40 guides for 1500 passengers

Additional Avian Field Experience

SAFRING Bird Ringer - 25 years of experience ringing birds across South Africa; including Fynbos; ID of birds, handling, data collection and reporting.

Coordinated Wetland Avifauna Counts (CWAC) – 1997 to present – participate in CWAC counts in the Western Cape – walking transects of estuaries along the West Coast and Overberg; data collection, collation and reporting.

Southern African Bird Atlas Project 2 (SABAP2) Atlasser – 2014 – present; participating in the SABAP2 project; requires a very good knowledge of bird ID based on both sight and sound.

Other qualifications

Level 1 First Aid 2022 (qualified for over 30 years)

Appendix-4 - Impact assessment method used

Impact assessment method as provided by Doug Jeffrey:

IMPACT ASSESSMENT CRITERIA

These criteria are drawn from the EIA Regulations published by the Department of Environmental Affairs and Tourism (April 1998) in terms of the Environmental Conservation Act, 1989 (Act No. 73 of 1989) and the latest basic assessment report template provided by the Department of Environmental Affairs and Development Planning (DEA&DP) and the DEA&DP Guidelines for involving Biodiversity Specialists in EIA Processes, 2005. These criteria include:

Nature of the impact

This is an appraisal of the type of effect (positive or negative) the construction, operation and maintenance of a development would have on the affected environment. This description should include what is to be affected.

Extent of the impact

Extent defines the physical extent or spatial scale of the impact. The impact could:

- • **Site specific:** limited to the site.
- • **Local:** limited to the site and the immediate surrounding area (1-10km).
- • **Regional:** covers an area that includes an entire geographic region or extends beyond one region to another.
- • **National:** across national boundaries and may have national implications.

Duration of the impact

The specialist should indicate whether the lifespan of the impact would be:

- • **Short term:** 0-5 years.
- • **Medium term:** 5-15 years.
- • **Long term:** beyond the operational phase, but not permanently).
- • **Permanent:** where mitigation either by natural processes or by human intervention will not occur in such a way or in such time span that the impact can be considered transient.

Consequence of Impact

Indicate how the activity will affect the environment.

Probability of occurrence

Probability describes the likelihood of the impact occurring. The likelihood can be described as:

- • **Improbable/unlikely:** low likelihood of the impact occurring.
- • **Probable:** distinct possibility the impact will occur.
- • **Highly probable:** most likely that the impact will occur.
- • **Definite:** impact will occur regardless of any prevention measures.

Irreplaceable loss of resources

Describes the degree to which resources will be irreplaceably lost due to the proposed activity. It can be **no loss of resources**, **marginal loss**, **significant loss** or **complete loss of resources**.

Reversibility

This refers to the degree to which an impact can be reversed.

- • **Fully reversible:** where the impact can be completely reversed.
- • **Partly reversible:** where the impact can be partially reversed.
- • **Irreversible:** where the impact is permanent.

Indirect impacts

Indirect impacts are secondary impacts and usually occur at a different place or time. Specialists will need to elaborate on any indirect or secondary impacts of proposed activities. If there are no indirect impacts specialist will need to briefly explain so. Page 2 of 4

Cumulative impact
An effect which in itself may not be significant but may become significant if added to other existing or potential impacts that may result from activities associated with the proposed development. Cumulative impacts prior to and post mitigation must be assessed. The cumulative effect can be:

- • **Negligible:** the impact would result in negligible to no cumulative effect.
- • Low: the impact would result in insignificant cumulative effects.
- • **Medium:** the impact would result in minor cumulative effects.
- • **High:** the impact would result in significant cumulative effects.

Significance rating of impacts prior to and after mitigation
Based on a synthesis of the information contained in the above-described procedure, the significance of the potential impacts must be assessed using the following significance criteria:

- • No impact.
- • **Low negative:** where it would have negligible effects and would require little or no mitigation.
- • **Low positive:** the impact will have minor positive effects.
- • **Medium negative:** the impact will have moderate negative effects and will require moderate mitigation.
- • **Medium positive:** the impact will have moderate positive effects.
- • **High negative:** the impact will have significant effects and will require significant mitigation measures to achieve an accepted level of impact.
- • **High positive:** the impact will have significant positive effects.
- • **Very high negative:** the impact will have highly significant effects and are unlikely to be able to be mitigated adequately.
- • **High positive:** the impact will have highly significant positive effects.

Degree to which impact can be avoided
This indicates the degree to which an impact can be avoided. The degree of avoidance can either be

- • **High**: impact is completely avoidable
- • **Moderate**: impact is avoidable with moderate mitigation
- • **Low**: the impact is difficult to avoid and will require significant mitigation measures
- • **Unavoidable**: the impact is cannot be avoided even with significant mitigation measures

Can the impact be avoided and if so, how can it be avoided (example: demarcation of no-go areas)?
Degree to which impact can be managed
This indicates the degree to which an impact can be managed. The degree of management can be:

- • **High**: impact is completely manageable
- • **Moderate**: impact is manageable with moderate mitigation
- • **Low**: the impact is difficult to manage and will require significant mitigation measures
- • **Unmanageable** (the impact is cannot be managed even with significant mitigation measures).

How can the impact be managed over time (example: clearance of alien vegetation)?
Degree to which an impact can be mitigated
This indicates the degree to which an impact can be reduced. The degree of mitigation can either be high (the impact can be fully mitigated), moderate (the impact can be partly mitigated) or not mitigated at all
Residual impacts
Residual impacts are those impacts that remain following the implementation of mitigation measures. Residual impacts must be identified, rated (i.e. low, medium or high) in accordance to the criteria in **Table 1** (taken from the Western Cape Guideline on Biodiversity Offsets, 2015) and discussed. If there are no residual impacts, the specialist will need to briefly explain that the activity will have no residual impacts**.** Page 3 of 4

Table 1: Criteria for Assessing Residual Impacts.

Threshold: The Importance of Biodiversity and/or Ecosystem Services	Impact Significance Rating

Exclusionary threshold; impacts in this category could not be fully compensated by offsets because of the high threat status or irreplaceability of affected biodiversity or ecosystem services. Impacts in this category would generally be unacceptable and could lead to:
• Irreversible and irreplaceable loss of ecosystem or species
  o Impacts on critically endangered ecosystems or species, or leading to a change in the status of ecosystems or species from endangered to critically endangered
  o Impacts on Critical Biodiversity Areas (CBAs) and River and Wetland FEPAs (including free-flowing rivers53) from provincial biodiversity plans/ the Biodiversity Framework, **unless** there are spatial options to meet the specific biodiversity targets for which these CBAs were identified
  o Impacts on Ramsar sites;
• Irreplaceable loss of key ecological corridors recognised as important for evolutionary processes and climate change adaptation where no spatial options to safeguard these processes exist;
• Irreversible impacts on legally protected areas in terms of the Protected Areas Act, including Special Nature Reserves, National Parks and Provincial Nature Reserves; World Heritage Sites; Marine Areas; Specially Protected Forest Areas; and Mountain Catchment Areas.
• Irreversible or irreplaceable loss of highly valued ecosystem services at national or provincial scale and/ or where there is a high level of dependence on these ecosystem goods and services by local communities for livelihoods and health, and no feasible substitutes
	Very High

Threshold of major potential concern. • Irreversible impact, leading to change in ecosystem or species status within the Endangered category, or from Vulnerable to Endangered • Irreversible loss of areas constituting important corridors or process areas at provincial level • Impacts in buffer zones of protected areas (including buffers around National Parks, World Heritage Sites, and Nature Reserves) • Impacts in Trans-Frontier Conservation Areas (outside of protected areas) • Impacts on high water yield areas ('water factories', 'water towers') • Impacts in the Coastal Protection Zone. • Impacts on priority estuaries, in an estuarine functional zone where no setback line has been determined, and/ or on the estuary side of the development setback line • Impacts within a 1km buffer of river and wetland FEPAs • Impacts seawards of the development setback line or within 1km from the HWM where no development setback line has been determined	High

Threshold: The Importance of Biodiversity and/or Ecosystem Services	Impact Significance Rating
• Impacts on the watercourse side of a development setback line or within 100m from the edge of a watercourse where no setback line has been determined • Impacts leading to loss or deterioration of valued ecosystem services at provincial level.	
Threshold of potential concern. • Irreversible impact leading to change in ecosystem status from Least Threatened to Vulnerable • Impacts on Vulnerable species • Loss of areas constituting important corridors or ecological process areas at local levels • Impacts on Ecological Support Areas • Impacts on Vulnerable ecosystems in areas where CBAs have not yet been identified. • Impacts on focal areas for protected area expansion (land-based and marine). • Impact comprising a combination of impacts at a local level on two or more of the following a) a threatened ecosystem, b) threatened species, c) special habitats and d) ecological corridors or important process areas. • Impact leading to loss or deterioration of valued ecosystem services at local level.	Moderate
Threshold of Low concern. e.g. low impact on local biodiversity or valued ecosystem services • Impacts on Least Threatened ecosystems where they do not: support threatened species or special habitats; constitute important ecological process areas or corridors; and/ or provide priority ecosystem services.	Low
Threshold of negligible concern. e.g. no impact on local biodiversity or valued ecosystem services • Impacts on heavily modified or transformed natural environments.	Very Low

Impact Tables

Please copy and paste this table into your report and repeat for every impact identified and to be assessed (Word format will be provided).

Alternatives will be provided once determined after constraints analysis is completed.

Geology / geohydrological / ecological / socio-economic / heritage and cultural-historical / noise / visual / aquatic ecosystem / fauna / terrestrial ecosystem / etc.	**Alternative A**	**Alternative B**	**No-Go Option**
PLANNING, DESIGN AND DEVELOPMENT PHASE			
Potential impact and risk:			
Nature of impact:			
Extent and duration of impact:			
Consequence of impact or risk:			
Probability of occurrence:			
Degree to which the impact may cause irreplaceable loss of resources:			
Degree to which the impact can be reversed:			
Indirect impacts:			
Cumulative impact prior to mitigation:			
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)			
Degree to which the impact can be avoided:			
Degree to which the impact can be managed:			
Degree to which the impact can be mitigated:			
Proposed mitigation:			
Residual impacts:			
Cumulative impact post mitigation:			
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)			

OPERATIONAL PHASE			
Potential impact and risk:			
Nature of impact:			
Extent and duration of impact:			
Consequence of impact or risk:			
Probability of occurrence:			
Degree to which the impact may cause irreplaceable loss of resources:			
Degree to which the impact can be reversed:			
Indirect impacts:			
Cumulative impact prior to mitigation:			
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)			
Degree to which the impact can be avoided:			
Degree to which the impact can be managed:			
Degree to which the impact can be mitigated:			
Proposed mitigation:			
Residual impacts:			
Cumulative impact post mitigation:			
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)			

Appendix-5 – Project description

As provided by Doug Jeffrey on 14 December 2022:

Lower Station

	Footprint area (m2)
Existing Guard House	6
Existing Pavillion Restaurant & Wine Tasting Includes adjacent WCs	236
Existing Underground Barrel Maturation Cellar and Conference Area	1660
Existing Grape Reception Area	134
Total footprint:	2036

The lower station and amenities will include:

Lower Cable Station / Machine Room	590
Parking Forecourt for circulation, drop-off and collection	1972
Undercover Parking Structure for 155 vehicles	1820
Generator, Wine Dispatch & Stores	124
Staff Change Rooms & Ablutions	74
HC Office Reception	81
Coffee Shop	185
Outdoor Classroom/Seating Arena	177
Town Square / Arrival Zone	160
Ticket Office	81
Ablution Facilities	162
Village Green - Cellar roof landscaping	1950

Total footprint:	7376

Top Station

Top Cable Station at NGL interface	680
SNP WC, Medical-room, Stores & Control room	51
Souvenir Shop	61
Adventure Centre	50
Walking Decks / Terraces	1468
Cultural & Heritage Centre	138
Franschhoek Vignerons Wine Bar	132
Ablution Facilities SNP / M / F	48
Pathways - approx. 597m at approx. 1.5 width	895
Restaurants (Enclosed areas incl BOH/kitchens) All Day Café ± 68 seats Potential Fine Dining Restaurant ± 68 seats	236 330
Helipad for emergencies only 15m diameter	177
Total footprint:	4266

Appendix-6 - List of bird species recorded at the Project Area

Annotated list of bird species recorded at the Project Area. The Study Site reporting rate is the percentage of visits that each species was recorded over 10 visits from February 2022 to February 2023 (March 2022 is excluded). A blank Red Data status can be taken as Least Concern.

Species	Red data status (Regional/Global)[1]	Endemism[2]	Top Site (October 2021)	Study Period (Reporting rate %)
Species of Conservation Concern (SCC)				
Striped Flufftail *Sarothrura affinis*	VU/LC		Suspected	0
Fynbos Buttonquail *Turnix hottentottus*	LC/LC*	E	Yes	0
Ground Woodpecker *Geocolaptes olivaceus*	LC/NT	SLS	Yes	70
Cape Rockjumper *Chaetops frenatus*	NT/NT	E	Yes	30
Sentinel Rock Thrush *Monticola exploratory*	LC/NT	SLS	Yes	10
Verreaux's Eagle *Aquila verreauxii*	VU/LC			70
Other Species				
Helmeted Guineafowl *Numida meleagris*				20
Cape Spurfowl *Pternistis capensis*		NE		80
Spur-winged Goose *Plectropterus gambensis*				20
Egyptian Goose *Alopochen aegyptiaca*				90
Speckled Pigeon *Columba guinea*				40
Little Grebe *Tachybaptus ruficollis*				40
Reed Cormorant *Microcarbo africanus*				60
African Darter *Anhinga rufa*				10
African Sacred Ibis *Threskiornis africanus*			Yes	10
Hadada Ibis *Bostrychia hagedash*			Yes	70
Booted Eagle *Aquila pennatus*				10
Rufous-breasted Sparrowhawk *Accipiter rufiventris*				10
Yellow-billed Kite *Milvus aegyptius*				10
Jackal Buzzard *Buteo rufofuscus*		NE	Yes	90
Red-faced Mousebird *Urocolius indicus*				10
Rock Kestrel *Falco rupicolus*				
Peregrine Falcon *Falco peregrinus*				50
Cape Batis *Batis capensis*				40
Bokmakerie *Telophorus zeylonus*				30
Southern Boubou *Laniarius ferrugineus*				60
Southern Fiscal *Lanius collaris*				10
Pied Crow *Corvus albus*				40
White-necked Raven *Corvus albicollis*			Yes	80
Cape Bulbul *Pycnonotus capensis*		E		30
Sombre Greenbul *Andropadus importunes*				10
Large Rock Martin *Ptyonoprogne fuligula*				60
Cape Grassbird *Sphenoeacus afer*		NE	Yes	90
Victorin's Warbler *Cryptillas victorini*		E	Yes	10
Grey-backed Cisticola *Cisticola subruficapilla*			Yes	60
Neddicky *Cisticola fulvicapilla*			Yes	100

Species	Red data status (Regional/Global)[1]	Endemism[2]	Top Site (October 2021)	Study Period (Reporting rate %)
Karoo Prinia *Prinia maculosa*		NE		70
Bar-throated Apalis *Apalis thoracica*				20
Cape White-eye *Zosterops virens*		NE		20
Cape Sugarbird *Promerops cafer*		E		90
Red-winged Starling *Onychognathus morio*				90
Olive Thrush *Turdus olivaceus*				10
Cape Robin-chat *Cossypha caffra*				90
Cape Rock Thrush *Monticola rupestris*		SLS		40
Familiar Chat *Oenanthe familiaris*			Yes	0
Orange-breasted Sunbird *Anthobaphes violacea*		E	Yes	100
Nicholson's Pipit *Anthus nicholsoni*			Yes	30
Cape Siskin *Crithagra totta*		E	Yes	100
Cape Canary *Serinus canicollis*			Yes	60
Cape Bunting *Emberiza capensis*		E	Yes	60

Conservation status

[1] = Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland EN = Endangered
VU = Vulnerable
NT = Near-Threatened
LC = Least Concerned
*Included as Species of Conservation Concern based on national and global status of Endangered in the 2015 Eskom Red data book (scoping report). Birdlife International 2022 status changed from Endangered to Least Concern based on new evidence.

Endemism

[2] = Checklist of Birds in South Africa 2022
SLS = Endemic to South Africa, Lesotho & Eswatini
E = Endemic to South Africa
NE = Near-endemic to South Africa