Specialist Botanical impact assessment for the proposed establishment of the Diepwalle tented forest camp.

Prepared for Cape EAPrac

Upon request from the applicant

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Confluent Environmental

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(Updated with a final SDP in January 2024)

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ABBREVIATIONS

BPA	Biodiversity Priority Area
BSP	Biodiversity Spatial Plan
CBA	Critical Biodiversity Area
CD:NGI	Chief Directorate: National Geo-spatial Information
DFFE	Department of Forestry, Fisheries and the Environment
EIA	Environmental Impact Assessment
EMP	Ecological Management Plan
ESA	Ecological Support Area
IAP	Invasive Alien Plants
NEM:BA	National Environmental Management: Biodiversity Act
ONA	Other Natural Areas
PAOI	Project Area of Influence
SANBI	South African National Biodiversity Institute
SCC	Species of Conservation Concern
SDP	Site Development Plan
SEI	Site Ecological Importance
SSVR	Site Sensitivity Verification Report

DECLARATION OF SPECIALIST INDEPENDENCE

The consulting services comprise an assessment of the potential sensitivity of the ecosystems and flora that fall within the development footprint for the site. The following declaration is given by the appointed specialist:

- I consider myself bound to the rules and ethics of the South African Council for Natural Scientific Professions (SACNASP).
- At the time of conducting the field assessment and compiling this report I did not have any interest, hidden or otherwise, in the proposed development that this report has reference to, except for financial compensation for work done in a professional capacity.
- Work performed for this site was done in an objective manner. Even if this results in views and findings that are not favourable to the client/applicant, I will not be affected in any manner by the outcome of any environmental process of which this report may form a part, other than being members of the general public.
- I declare that there are no circumstances that may compromise my objectivity in performing this specialist investigation. I do not necessarily object to or endorse any proposed developments, but aim to present facts, findings and recommendations based on relevant professional experience and scientific data.
- I do not have any influence over decisions made by the governing authorities.
- I undertake to disclose all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by a competent authority to such a relevant authority and the applicant.
- I have the necessary qualifications and guidance from professional experts in conducting specialist reports relevant to this application, including knowledge of the relevant Act, regulations and any guidelines that have relevance to the proposed activity.
- This document and all information contained herein is and will remain the intellectual property of Confluent Environmental. This document, in its entirety or any portion thereof, may not be altered in any manner or form, for any purpose without the specific and written consent of the specialist investigators.
- All the particulars furnished by me in this document are true and correct.

Signed: 10 August 2023 (Updated with final SDP in January 2024)

BIANKE FOUCHÉ ABRIDGED CV

Qualifications

- B.Sc. Environmental Sciences,
- B.Sc. Honours (Botany),
- M.Sc. Conservation Biology 2022-2023 (currently completing at the University of Cape Town. Graduation is October 2023).

SACNASP Registration No: 141757 (Candidate Botanical Scientist)

Skills and Core Competencies

- My MSc research will add to our understanding of plant community niche construction and Alternative Stable State (ASS) theory. The knowledge gained will be used to advise landscape stewardship practices, especially regarding reforestation initiatives in the Overstrand.
- I have worked closely with the conservation team of the Grootbos Foundation, where I assisted with vegetation surveys, mounting voucher specimens in the Grootbos herbarium, and taken part in controlled fynbos fires in the Overberg.
- Postgraduate studies of mine included assessing the allelopathic effects of *Eucalyptus* leaves on garden peas and leeks and assessing the accuracy of the climate leaf analysis multivariate programme (CLAMP) in predicting the climate of fynbos vegetation.
- In Cape Town I regularly took part in alien clearing activities and helped to identify relevant listed invasive plants.
- I am currently a member of the Botanical Society of South Africa and the custodians for rare and endangered wildflowers (CREW) in George.

References

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1. INTRODUCTION

1.1 Background & description

Confluent Environmental was contracted by the Applicant on the recommendation of Cape EAPrac to undertake a Botanical survey for the proposed tented camp in and around a clearing in the Diepwalle Forest. The proposal thus far states that the camp will be operational during the summer. The initial date for the opening on the camp was for November of 2023. SANParks and Chiefs Tented Camps are collaborating on this project, and the existing camp at Diepwalle will cater and provide reception for the guests of the proposed camp. As stated in the aquatic compliance report, the catering services will include food preparation and bulk storage (Dabrowski, 2023). The reasoning behind this is that this will reduce traffic in the area of the new proposed camp site. According to the Department of Forestry, Fisheries, and the Environment (DFFE) Screening Tool, the botanical assessment is required because the terrestrial plant species theme has been highlighted as having a Medium sensitivity across the entire proposed development site. The terrestrial biodiversity theme is not covered in this report, but since this protocol also speaks to the botanical theme, a brief mention of its triggers is also warranted here. The plant species theme is triggered due to several species of conservation concern (SCC) that are potentially present in the area. The purpose of this SSVR is to verify the presence of the any plant species of conservation concern (SCC) are present at the site. The terrestrial biodiversity has a Very High sensitivity due to the area being mapped as part of 1) FEPA Sub-catchments, 2) National Forestry Inventory (NFI), 3) Strategic Water Source Area (SWSA), and 4) Garden Route National Park.

1.2 General location

Diepwalle Forest is located north of Knysna in the Western Cape (Fig. 1). The clearing in the forest (see the cover image of this report) was previously featured in the films "Kringe in 'n Bos" and "Fiela se Kind". The following description of the location of the camp is provided in the aquatic specialist report:

> *"The proposed tented camp site is in an existing clearing within Diepwalle Forest on RE/218 in the Knysna section of the Garden Route National Park. The clearing is approximately 13 km North-east of the town of Knysna in a straight line. Access is via a 1.6 km existing private forest track off the R339 gravel road. The R339 provides current access to the existing Diepwalle camp and offices which are managed by SANParks."* (Dabrowski, 2023)

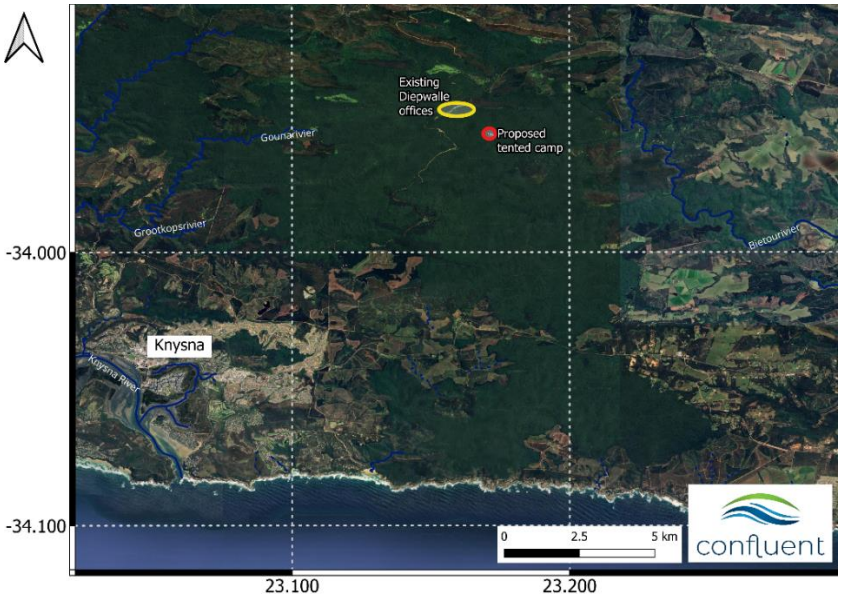

Figure 1: The general location of the proposed camp (red circle) and existing Diepwalle offices (yellow circle).

1.3 The development layout

The proposed tented camp is planned to include 15 luxury tented camps (Fig. 2). These camps will be temporary in the forest landscape, and during the off season (i.e., the winter) tents and other moveable materials will be removed from the site. Materials that will be left on the site include the 15 guest tent platforms (5 x 10m each), the communal dining deck (20 x 15m), 5 staff tent decks (3 x 6m each), kitchen and storage tents (three of these structures are proposed, each of which will be 5 x 10m, however this number may decrease given that the existing camp of Diepwalle will provide some storage and because food will not be prepared in the proposed new luxury camp area), and lastly raised wooden boardwalks that link all the different decks (some sections may be removed to ensure the forest environment remains connected to the clearing; this is especially important for some anima; species, as will be described in the animal species theme specialist study for this proposed development.

Water supply to the camp has been suggested as a gravity fed pipeline from the existing Diepwalle camp into two 5000 – 10 000 L storage tanks in the proposed campsite (Fig. 2 labels these as "Fresh Water Tank"; the final size of the tanks are not yet set in stone, but the on the ground footprint should not be affected by the storage capacity range mentioned). Sewage for the proposed luxury camp will be handled using sealed chemical toilet that will be housed within the tents. Toilets will be emptied by a service provider from the Knysna Wastewater Treatment Works. Most of the actions that require power will be conducted using gas, namely heating food, and heating water for showers. A combination of solar power and low-decibel generators (gas / diesel) has been proposed for additional energy requirements, which is likely only lighting for the camp.

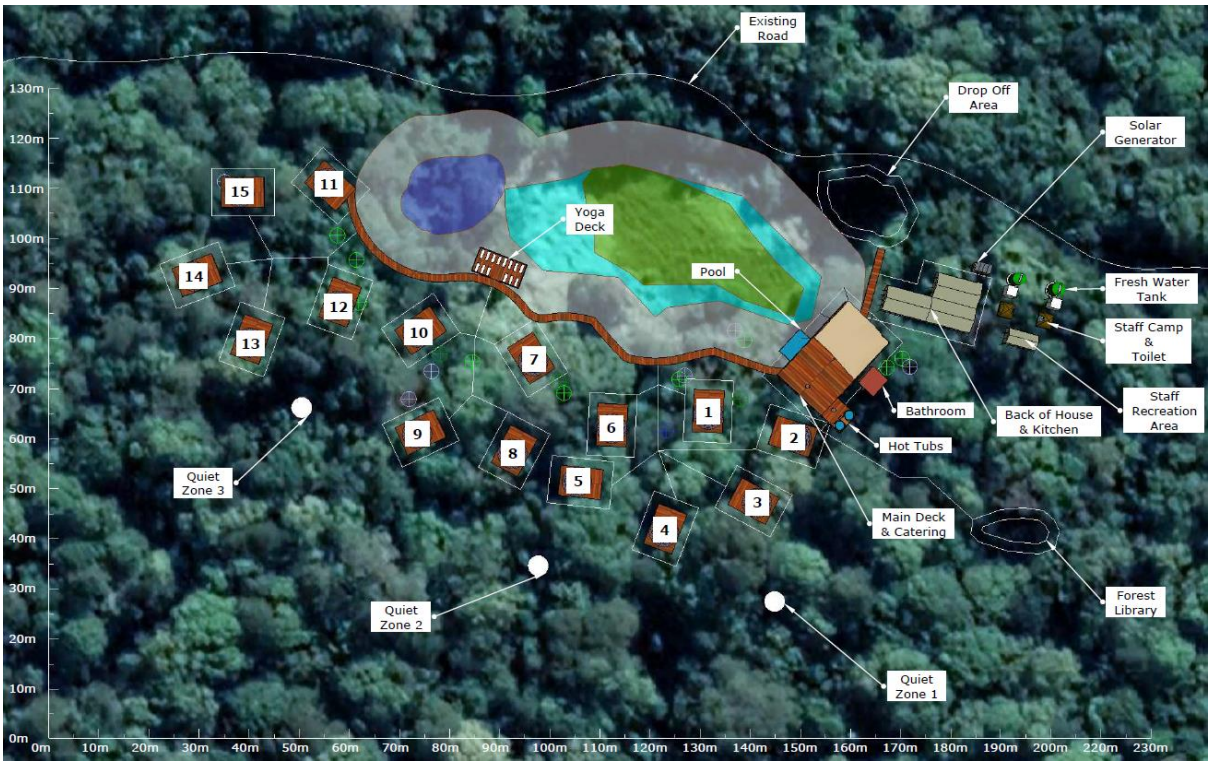

Figure 2: The August 2023 version of the site development plan for the proposed tented camp. One final layout is provided in Appendix 11.5. The dark blue polygon is an excavated pool on the site, the green polygon represents the seasonal wetland with a temporary wetland being the surrounding light blue polygon. The light grey polygon surrounding the pool and wetland areas is the buffer area, as delineated by the aquatic specialist (Dabrowski, 2023).

1.3.1 Updated development layout (January 2024)

The Site Development Plan (SDP) underwent multiple revisions with Fig. 2 being the last layout that was provided in 2023. Subsequently, in January 2024, a final SDP was provided for submission of the Basic Assessment which is shown in Appendix 11.5. The final SDP was refined based on feedback from SANParks, the Department of Forestry, Fisheries and Environment (DFFE), as well as botanical, faunal and this aquatic specialist reports. Most changes relate to smaller footprints of various structures, and more detail was provided on certain services. Differences to the original layout and additional service details are not considered to change the outcome, findings, or recommendations of this original report in any way and are highlighted as follows:

Fixed infrastructure

- Guest tent platforms on reduced footprint of wooden decks to ±8.5m x 6m (reduced);
- Accommodation in dome tents, each with a chemical toilet, basin, and shower;
- Drop-off area moved into the wetland buffer;
- Tent 12 platform and small section of wooden boardwalk moved into the buffer, but the yoga deck was moved out of the buffer;

Confirmed Services

- Water & Sewage: As per original description – no change.
- Greywater: directed to soak-aways along existing slip-paths in forest. This is directed away from the wetland and buffer area.
- Heating: Gas for heating water and food. Meals to be cooked / prepared at SANParks Main Diepwalle Camp & transported to site.
- Lighting: Solar panel generator, with batteries on mobile trailer.

2. TERMS OF REFERENCE

This screening tool sensitivity verification report provides information on Botanical diversity and sensitivity of the proposed development. The results presented are based on a desktop and field assessment, which includes a consideration of historical photographic records of the site. The assessment presented in this report follows the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant Species themes.

This site sensitivity assessment follows the requirements of:

- The Environmental Impact Assessment Regulations, as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), which includes:
    - The protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial plant species (30 October 2020).
- Additional guidelines for the terrestrial plant species theme:
    - Species Environmental Assessment Guideline: Guidelines for the implementation of the Terrestrial Flora (3c) & Terrestrial Fauna (3d) Species Protocols for environmental impact assessments in South Africa (Verburgt et al., 2020).

The assessment was undertaken by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP) with relevant expertise in the field of Botanical and/or Ecological science.

2.1 Online Screening Tool

The Department of Forestry, Fisheries, and the Environment (DFFE) screening tool report for the development footprint has identified the **terrestrial plant species theme as having a Medium sensitivity**, and the **terrestrial biodiversity theme as having a Very High sensitivity**. The reasons for the terrestrial plant sensitivity theme are the possible occurrence of species of conservation concern (SCC) on the site. A Medium screening tool sensitivity for plants indicates that:

> *"Model-derived suitable habitat areas for threatened and/or rare species are included in the medium sensitivity level. Two types of spatial models have been included. The first is a simple rule-based habitat suitability model where habitat attributes such as vegetation type and altitude are selected for all areas where a species has been recorded to occur. The second is a species distribution model which uses species occurrence records combined with multiple environmental variables to quantify and predict areas of suitable habitat. The models provide a probability-based distribution indicating a continuous range of habitat suitability across areas that have not been previously surveyed. A probability threshold of 75% for suitable habitat has been used to convert the modelled probability surface and reduce it into a single spatial area which defines areas that fall within the medium sensitivity level."* ~ (Verburgt et al., 2020)

3. METHODOLOGY

3.1 Desktop Assessment

The desktop assessment was performed using Cape Farm Mapper and QGIS version 3.28.3 "Firenze". Plant species data was sourced from the following sources:

- The DFFE screening tool listed SCC.
- Information on plant occurrence prior to the site visits were sourced from SANBIs Botanical Research and Herbarium Management System (BRAHMS) for the Plants of Southern Africa (POSA) database.
- iNaturalist observations of the property and surrounding areas.

The vegetation type is linked to the plant species theme, and it is considered in this report. Ecosystem / vegetation type data was sourced from:

- The 2018 updated South African National Vegetation Map from SANBIs Biodiversity GIS (BGIS) database, and the National Biodiversity Assessment report of 2018 (Skowno et al., 2018).
- Shapefiles for the Western Cape Biodiversity Spatial Plan (WC-BSP; see Appendix 11.2) i.e., information on PAs, CBAs, ESAs, and ONAs were downloaded from BGIS database (CapeNature, 2017; Pool-Sandvliet et al., 2017).
- Cape Farm Mapper for additional spatial information required for the site.
- Chief Directorate: National Geo-spatial Information (CD: NGI) Geospatial Portal and Google Earth for the acquisition of historical aerial imagery of the site.
- The conservation status of ecosystems was found in the Revised National List of Ecosystems that are Threatened and in need of protection, published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004, as revised in Nov. 2022), and also using The Vegetation of South Africa, Lesotho, and Swaziland (Mucina & Rutherford, 2006).

3.2 Field Assessment

Field work was undertaken on the 02nd of March and 28 July 2023. On the 29th of August 2023 another field day was arranged with various stakeholders in order to identify important features on the site that needed to be avoided by the layout. The method for identifying species was similar to a BioBlitz, also described as a "timed meander," where the specialist especially keeps an eye out for rarer and threatened species. Some Red Listed Plant species are more easily spotted and found during a site survey than other species. This survey method is an attempt to account for the short survey periods, where detection probability of some rare and threatened species (e.g., geophytes, small succulents, small perennials etc.) are low (Garrard et al., 2008; Wintle et al., 2012). Observations of individual species and environmental characteristics were documented using an android app "Spot Lens" as well as a Garmin GPS. A provisional species list for the plants not listed in the report body is provided in Appendix 11.1. The likelihood that the majority of plant species have been found during the survey is discussed in the results section of the report, with a species accumulation curve for the duration of the site assessment is also presented in Appendix 11.1.

3.3 Assumptions & Limitations

This assessment is subject to a few assumptions, uncertainties, and limitations, as listed below:

- Seasonal and time constraints always play a role in limiting the findings of a terrestrial specialist report. The field surveys for this report took place on one day in Autumn and Winter respectively. Some species may not have been visible at the time of the site assessment (e.g., some geophytes, annuals, and parasitic plants).
- Many of the very tall (>5m) trees in the forest environment were more difficult to identify on the forest.
- The location of individual trees in the forest is hard to map as trees are everywhere and a GPS point recorded only has a maximum accuracy of up to about 2-4m.
- Some rare and threatened plant species are difficult to locate and easily overlooked in the field (e.g., geophytes, small succulents, small shrubs, and cryptic spp.). It is very likely that the species list and SCC reported are not exhaustive (Perret et al., 2023).
- The forest made it hard to gain access to some sections of the site, and also means that some plants / SCC may have been missed.
- The last limitation is the same as in the aquatic specialist report, i.e., "*The clearing has an extended history spanning several disturbance events including being used as a film set in the 1990s and being used by wood cutters in the late 1800s. While aerial imagery can provide an*

insight into the state of the site post the 1930s, it is not possible to determine the dominant vegetation or degree to which the site was 'wet' or disturbed during initial clearing in the historical woodcutting period." (Dabrowski, 2023).

4. RESULTS: DESKTOP ASSESSMENT

4.1 Climate & soil

The climate of Diepwalle is similar to that of Knysna. The mean annual precipitation (MAP) is around 806 mm (which is a relatively high rainfall) and the mean annual temperature (MAT) is around 21 ˚C. The erosion potential for soils in this area is 0.52 according to Cape Farm Mapper, which is considered a high risk for erosion. However, the soils on the site are kept firmly in place by all the vegetation and also the fact that the site is on a relatively flat surface (Dabrowski, 2023).

4.2 Vegetation type(s)

The proposed development is mapped entirely as Southern Afrotemperate Forest (FOz1; a Least Concern vegetation type which is, however, protected in South Africa because it is part of our National Forest Inventory). The site falls within the Garden Route National Park which is a Protected Area (see BOX 1 below). It is also part of a wider World Heritage Site and Freshwater Ecosystem Priority Area (FEPA). Some sections of the Knysna forests are broken up by small pockets of South Outeniqua Sandstone Fynbos, as can be seen on our National Vegetation Map (Dayaram et al., 2019; Mucina & Geldenhuys, 2006). However, the clearing on the proposed site is not an example of this fynbos type as it does not have the right species (it is dominated by two Helichrysum species, namely *Helichrysum petiolare* and *H. cymosum*), and it is confirmed to be wetland habitat (Dabrowski, 2023).

BOX 1: The Biodiversity Spatial Plan

Protected Areas

Definition: Areas that are proclaimed as protected areas under national (National Environment Management: Protected Areas Act, Act 57 of 2003) or provincial (Mountain Catchment Areas Act, Act no 63 of 1970) legislation.

Objective: Keep in a natural state, with a management plan focused on maintaining or improving biodiversity. A benchmark for biodiversity conservation.

4.3 Historical Aerial Imagery

High resolution historical imagery (Fig. 3) can be sourced upon request from the CD: NGI Geospatial portal, or from their offices in Mowbray, Cape Town. Google Earth is also a repository of more recent historical images. The earliest historical image for the site is from December of 1936. The wider forest has experienced some long-term disturbance from human activities over the last century that seem to have remained relatively consistent in extent and intensity. The majority of the cleared area to the north of the proposed camp has revegetated. The 1936 imagery reveals that the forest had an additional small clearing south of the extant clearing at this time, however at the next timestamp in 1957 the small clearing is no longer visible (Fig. 3). In 1983 some intensified clearing is seen in the wider landscape outside of the proposed camp site, perhaps due to construction efforts for the existing main Diepwalle offices and facilities.

The clearing where the camp is proposed is approximately 2 900 m^2 (Dabrowski, 2023), and this area seems to have remained relatively constant in size since the 1930s. Today the margins of the clearing are less sharp compared to the earlier imagery presented in Fig. 3. The clearing, as many others observed in the surrounding landscape, occurs next to roads that have been made in the landscape. It is very likely that the clearing was first made by logging activities, which would also help to explain its rectangular

shape in the earlier images going back to 1936. The excavated pond is not visible on the images and is likely obscured by trees. In the 2002 and 2022 imagery, the clearing is seen to be dominated by two species, *Helichrysum petiolare* (greyish colour "liquorice bushes) and *H. cymosum* (darker green fume everlasting bushes). The pattern that these two species take in the clearing has changed in the past 20 years, but the clearing size has remained constant. Numerous factors may affect the vegetation pattern observed (e.g., the average moisture over the year, dead vegetation buildup, the establishment of trees and other bushes in the clearing).

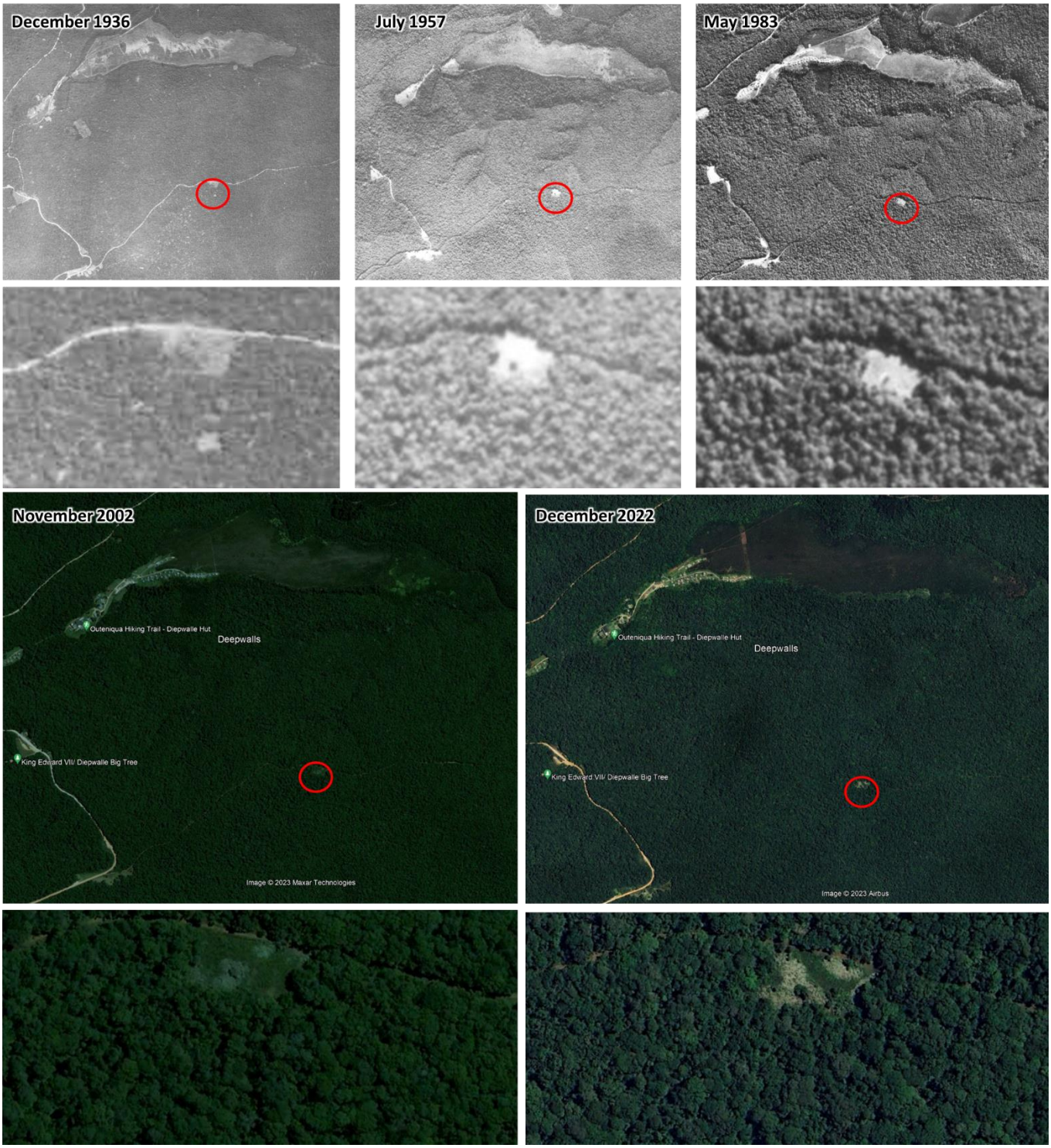

Figure 3: A series of historical imagery showing the wider forest around the proposed camp area (i.e., the red circles around the clearing and surrounding forest), with a zoomed in image of the specific proposed camp site. The date of each set of images is given.

4.4 Plant Species

The plant species theme sensitivity of Medium is dependent on the presence, or likely presence, of several plant species of conservation concern (SCC).

4.4.1 Species of conservation concern (SCC) listed in the screening tool

Several SCC have the potential to occur on the site. The SCC that were listed in the screening tool report were:

- *Faurea macnaughtonii* (Terblans beechwood)
- *Ocotea bullata* (Stinkwood)
- *Amauropelta knysnaensis* (Knysna wood fern)
- *Psydrax capensis*
- Sensitive species 763

4.4.2 SCC identified nearby.

On POSA no nearby SCC are recorded. The area that was searched on iNaturalist can be accessed from this link: Observations · iNaturalist. SCC that have been observed nearby on iNaturalist are.

- *Aloe kniphofioides* (Grass aloe)
- *Brunsvigia josephinae* (Josephines candelabra)
- *Curtisia dentata* (Assegai tree).
- *Crinum moorei* (Natal Swamplily)
- *Erica glandulosa* (Glandular heath)
- *Haworthiopsis attenuata* (Zebra haworthia)
- *Pelargonium citronellum* (Lemonbalm storksbill)
- *Podranea ricasoliana* (Pink trumpet vine)

5. RESULTS: FIELD ASSESSMENT

5.1 Plant species of conservation concern (SCC) and protected trees

The species of conservation concern that were observed were *Ocotea bullata* and *Curtisia dentata* (Fig. 4). *Faurea macnaughtonii* and *Psydrax capensis* was not observed, but that does not mean that it is a true negative for the site. Tree species that are not on the South African Red List, but that are considered as protected tree species are the two yellowwood tree species *Podocarpus latifolius* (protected tree no. 18 – the most abundant protected tree in the forest) and *Afrocarpus falcatus* (protected tree no. 16). Some additional species warrant careful attention, especially trees with epiphytic orchids (Fig. 5), as these orchids are often poached when more people become aware of their presence in an area (regardless of if the species is Red Listed or not). One such epiphytic orchid was observed on *Podocarpus latifolius* trees was *Angraecum pusillum* (the white dwarf shell orchid) (Fig. 4 & 5). Ground orchids *Disperis lindleyana* (Fig. 5) were also observed in the forest surrounding the clearing. Both of these orchid

species are Least Concern on the South African Red List, but they warrant consideration to prevent a negative change in their Red List status.

Figure 4: Images of the red listed and protected tree species that were observed in the forest surrounding the wetland clearing patch. Bark photos are included for the two yellowwood species as a way to identify very tall trees.

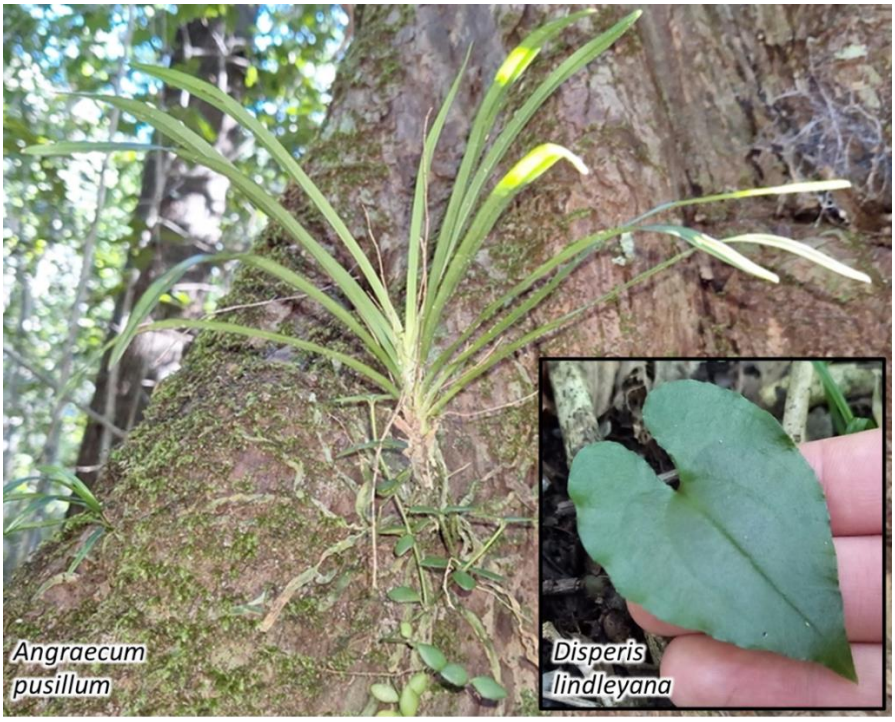

Figure 5: The two orchid species that were observed in the site footprint.

Furthermore, the forest is home to some often-overlooked non-vascular plants – mosses. Two of the more spectacular moss species that were observed during the site assessment were *Pyrrhobryum spiniforme* and *Atrichum androgynum* (Fig. 6). Many more moss species were seen, but not all of the moss species were documented for this survey. The species mentioned may warrant careful replanting elsewhere in the forest where clumps of them may fall under platforms on the site.

Figure 6: Photos of three moss species observed within the development footprint.

Lastly, the forest was full of yellowwood trees and many *Ocotea bullata* seedlings were present in the forest environment. Fig. 7 is a snapshot of a small section of the proposed camp site, and it is used to illustrate the difficulty of accurately showing where certain red listed and protected trees are in a forest environment. A description of the trees presented on the images in Fig. 7 is provided in the caption. Accurately "mapping" out individual non-transplantable trees is a difficult task for the following reasons:

1. GPS points are only accurate to 2-4m, which makes mapping multiple trees difficult.
2. Many trees seem small (small diameter at breast height, i.e., DBH), but they are in fact very tall already (>5m) and can't be transplanted. It is not possible to map all these trees for they make up the majority of the trees in the forest.
3. Many large trees are hard to identify with foliage in the forest canopy far above. Luckily yellowwood trees are easily identifiable by their bark, but this is a harder for some other trees.
4. Mapping of trees during the planning phase is very time consuming and requires marking trees temporarily. The mark is a thin biodegradable plastic lint which should be avoided if possible.

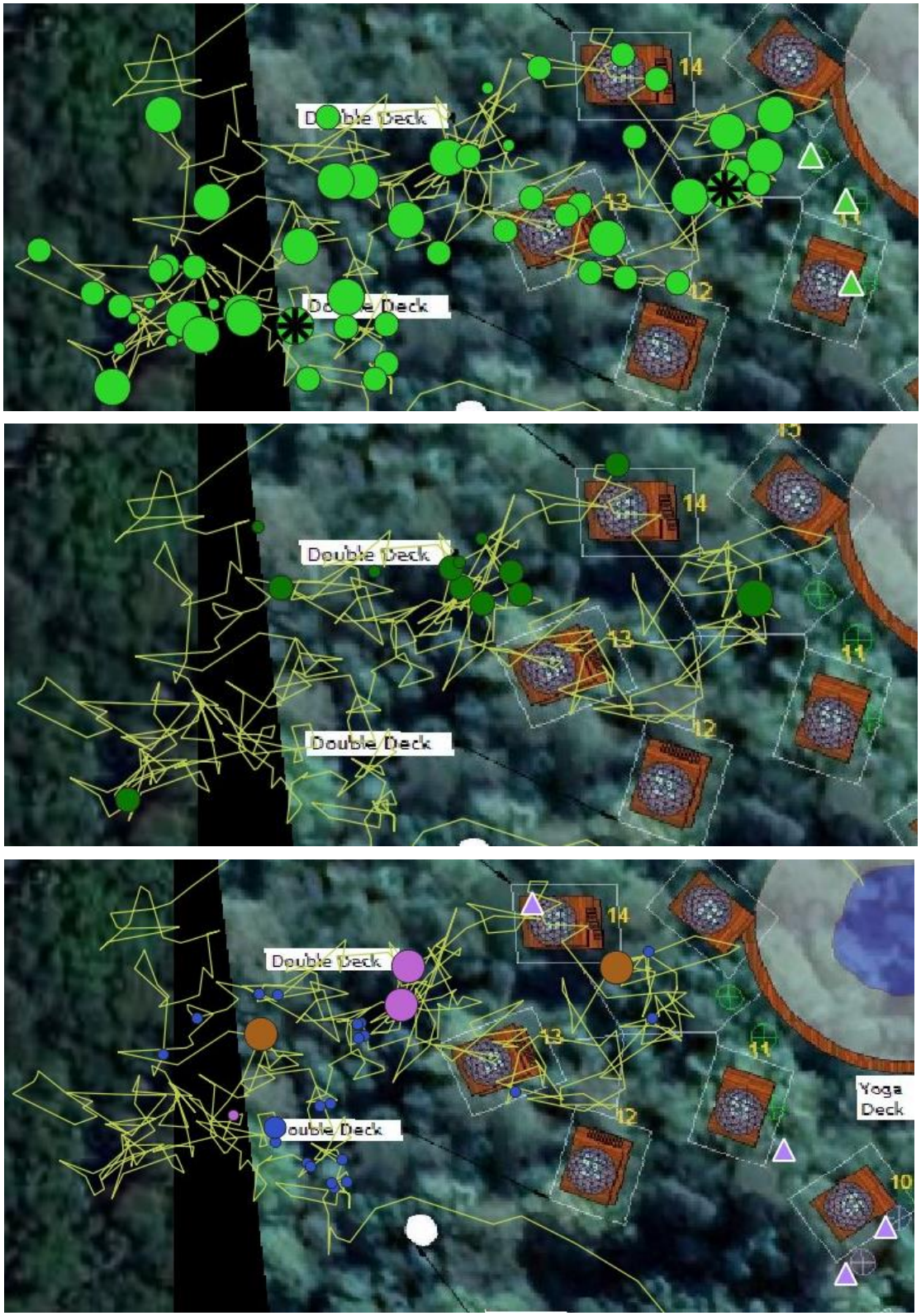

Figure 7: A rough approximation of the various protected and Red Listed Trees on the site over the proposed development plan. The top image represents *Podocarpus latifolius*, middle represents *Afrocarpus falcatus* (trees with black stars in the top image represents trees with tree orchids on them), and the bottom image shows *Ocotea bullata* (dark blue), *Curtisia dentata* (light purple) and other large trees (brown). Large circles represent large trees, medium circles are medium trees, and small circles are small trees. Triangles are observations that were made during the first site assessment in March.

5.2 Naturalised exotic and invasive plant species

Several exotic and invasive species were observed on the site (Table 1), especially within the wetland area that is dominated by overgrown *Helichrysum spp*. Almost none of the invasive and exotic naturalised species listed in Table 1 were observed outside of the clearing (i.e., in the forest). Invasive species for South Africa is summarised in two pieces of legislation, namely the National Environmental Management: Biodiversity Act 10 of 2004 (or simply the NEMBA, which is summarised in BOX 2) and the Conservation of Agricultural Resources Act 43 of 1983 (or CARA). Images of all the listed plants on the site are illustrated in Fig. 8.

Table 1: A list of the exotic species found on the site. All listed invasive species are either in red or in orange, depending. Red rows indicate species that are on both the NEMBA and CARA invasive species lists, while the orange row is only listed under NEMBA.

Species	Common name	Family	NEMBA	CARA	Area
Acacia stricta	Hop wattle	Fabaceae	1a	NA	Wetland
Centella asiatica	Gotu Cola	Apiaceae	NA	NA	Wetland
Hypochaeris radicata	Common cat's ear, dandelion	Asteraceae	NA	NA	Wetland
Plantago lanceolata	Ribwort plantain	Plantaginaceae	NA	NA	Wetland
Rosa rubiginosa	Sweet brier	Rosaceae	1b	1	Wetland
Rubus spp.	Brambles	Rosaceae	1a or 1b	1 or 2	Wetland

Figure 8: Photos of the invasive plants that were observed in the clearing on the site. On the left is the Hop wattle, in the middle is the sweet briar with fruit, and on the right is a bramble species also with fruit.

BOX 2: NEMBA categories for listed invasive alien plants (IAPs)

Category 1a

- Species which must be combatted or eradicated.
- Immediate steps must be taken to eradicate and combat or eradicate.
- Authorised officials must be permitted to enter properties to monitor, assist with or implement the combatting or eradication.
- If an Invasive Species Management Programme has been developed, a person must combat or eradicate the listed invasive species in accordance with such programme.

Category 1b

- Species which must be controlled.
- Property owners and organs of state must control the listed invasive species within their properties.
- If an Invasive Species Management Programme has been developed, a person must control the listed invasive species in accordance with such programme.
- Authorised officials must be permitted to enter properties to monitor, assist with or implement the control of listed species.
- Any Category 2 listed species (where permits are applicable) which fall outside of containment and control, revert to Category 1b and must be controlled.
- Any Category 3 listed species which occur within a Protected Area or Riparian (wetland) revert to Category 1b and must be controlled.
- The Minister may require any person to develop a Category 1b Control Plan for one or more Category 1b species occurring on a property.

Category 2

Any species listed under Category 2 requires a permit issued by the Department of Forestry, Fisheries, and the Environment (DFFE) to carry out a restricted activity (See Permit Applications.)

- A permit is required to carry out any restricted activity.
- No person may carry out a restricted activity in respect of a Category 2 listed invasive species without a permit.
- A person in control of a Category 2 listed species must take all necessary measures to ensure that specimens of the species do not spread outside of the land or area, such as an aviary) specified in the permit.

5.3 Additional SCC that may be found

All SCC that may be present on the site have been identified using the screening tool report for the site, iNaturalist nearby observations (Table 2). The probability of occurrence is reported as medium where the site meets the habitat requirements of a species, and recent observations have been made nearby.

Table 2: Plant SCC probability of occurrence for the proposed luxury camp of Diepwalle.

Species	Common name	Family	Growth form	Source	SANBI red list status	Probability of occurrence
Afrocarpus falcatus	Outeniqua yellowwood	Podocarpaceae	Tree	Observed	Protected tree no. 16	**Confirmed** This tree species was observed within the development footprint and was relatively abundant.
Podocarpus latifolius	True yellowwood	Podocarpaceae	Tree	Observed	Protected tree no. 18	**Confirmed** This was the most common protected tree in the site development footprint in the forest.
Curtisia dentata	Assegai tree	Curtisiaceae	Tree	iNaturalist	Protected tree 570; Near Threatened A2d	**Confirmed** This species was observed in more localised patches within the site development footprint.
Ocotea bullata	Stinkwood	Lauraceae	Tree	DFFE Screening tool	Protected tree 118; Endangered A2bd	**Confirmed** This species was observed mostly as seedlings. It was very abundant in some sections within the site development footprint, and care must be taken when dealing with this species given that it is an EN species.
Psydrax capensis	Cape Forest Quar	Rubiaceae	Tree	DFFE Screening tool	Vulnerable B1ab(iii)	**High** Langeberg Mountains near Grootvadersbos to Knysna in Southern Afrotemperate, coastal and submontane forests. This tree species was not observed but could likely be present as its habitat requirements are met
Dioscorea sylvatica	Forest elephantsfoot	Dioscoraceae	Climbing tuberous geophyte	Specialist inclusion	Vulnerable A2cd	**High** This species occurs in forests and has a high probability of occurrence.,
Faurea macnaughtonii	Terblans beechwood	Proteaceae	Tree	DFFE Screening tool	Rare	**High** This species occurs in various forest habitats in South Africa; however, its dispersal is limited. This species is therefore often found in fragmented pockets in forests. There is a high likelihood this species is at the site as its habitat requirements are met.
Amauropelta knysnaensis	Knysna wood fern	Thelypteridaceae	Fern	DFFE Screening tool	Vulnerable D2	**High** This species occurs in damp places in forests, but none were observed within the development footprint. There is a high probability of occurrence following the precautionary principle since habitat requirements are met by the site.

Sensitive species 763	-	Orchidaceae	Rhizomatous geophyte	DFFE Screening tool	Vulnerable A2c	**Medium** This species is distributed along the coast between Riversdale to Port St Johns. It is found in a wide range of habitats, namely renosterveld, fynbos, thicket, and Afrotemperate Forests, although it usually likes grassy vegetation in forest environments. There is a possibility that this species might occur here.
Crinum moorei	Natal swamplily	Amaryllidaceae	Geophyte	iNaturalist	Vulnerable A4de	**Low** This species is occurs from the Wild Coat north to Ngome. There is some evidence to suggect that it has been planted elsewhere too. It grows in forest habitat. This species is unlikely to be present on the site.
Erica glandulosa fourcadei	Glandular heath	Ericaceae	Shrub	iNaturalist	Vulnerable B1ab(ii,iii,iv,v)	**Low** Found between Mossel Bay and Cape St. Francis in strandveld and fynbos habitat, this species is unlikely to be in the development footprint.
Haworthiopsis attenuata	Zebra haworthia	Asphodelaceae	Succulent	iNaturalist	Vulnerable A2cd+4cd	**Low** This species is found in bushveld and thicket habitat. It is unlikely to be present in the development footprint as its habitat and distribution requirements are not quite met.
Aloe kniphofoides	Grass aloe	Asphodelaceae	Succulent	iNaturalist	Near Threatened B1ab(iii)	**Very Low** This species is not found in the Western Cape.
Brunsvigia josephinae	Josephines candelabra	Amaryllidaceae	Geophyte	iNaturalist	Vulnerable A2c; C2a(i)	**Very Low** This species is found between Nieuwoudville and Baviaansklood in soils with high clay content in renosterveld and karoo habitats. It is not present in the footprint.
Pelargonium citronellum	Lemonbalm storksbill	Geraniaceae	Perennial	iNaturalist	Rare	**Very Low** This species is found along the Langeberg Mountains and Klein Swartberg between Ladismith and Herbertsdale in thicket, fynbos, and succulent karoo habitats. It is definitely not present.
Podranea ricasoliana	Pink trumpet vine	Bignoniaceae	Vine / Climber	iNaturalist	Vulnerable D2	**Very Low** A highly localized endemic found in a restricted habitat (forest margins), but it is only found in the Eastern Cape Province near Port St. Johns. It not likely to be present within the development footprint.

6. SITE SENSITIVITY VERIFICATION

6.1 Botanical diversity

The site sensitivity in terms of the terrestrial plant species theme is confirmed as:

- **High** for the forest habitat on the site. The reason for the assigned sensitivity is the presence of species of conservation concern (SCC) that are listed in the South African Red List of SANBI
- **Low** for the wetland clearing as no species of conservation concern were found there. However, even though the botanical theme has a low sensitivity, the clearing provides habitat heterogeneity and is consistent with definitions for seasonal and temporary wetland habitat (Dabrowski, 2023) which also must be considered as important habitat and ecosystem features.

7. SITE ECOLOGICAL IMPORTANCE

The site ecological importance (SEI) that calculated in this report does not equate to the protocol sensitivity for the site (i.e., as per the protocol definitions), rather it is intended to provide a more refined overview of the botanical ecology and functionality of the site. The SEI is also only applicable to the proposed tented camp and does not apply for any other activity. If a different project is proposed, the SEI will need to be revised. This refined SEI map (Fig. 9) can be combined with the SEI maps provided by other specialists (e.g., an avifauna specialist). The benchmark for "fully natural" vegetation according to the Vegetation Assets, States, and Transitions (VAST) framework is set at pre-European conditions (i.e., period prior to the 1700s or 1600s). The VAST framework (Thackway & Lesslie, 2006):

- Describes and accounts for changes in the condition and status of vegetation.
- Makes explicit links between land management (current) and vegetation modification.
- Provides a mechanism for describing the consequences of certain land management on vegetation.
- Contributes to the analysis of terrestrial ecosystem services that are provided by vegetation, including comparison between various land-uses.

The VAST framework categories are illustrated in Table 3. Most of the vegetation on the site is a natural forest, and the vegetation in the clearing is in a modified secondary state (Table 4). The SEI methods used in Table 4 are illustrated in Appendix 11.3. The mitigation for the SEI relevant SEI categories are presented in Table 5.

Table 3: Vegetation Assets, States, and Transitions (VAST) framework with columns representing states and shifts between them defined as transitions, as laid out in (Lesslie et al., 2010; Thackway & Lesslie, 2006).

Increasing modification

		Native vegetation cover Dominant plant species indigenous to the locality and spontaneous in occurrence, i.e. a vegetation community described using definitive vegetation types relative to estimated pre 1750 types				**Non-native vegetation cover** Dominant structuring plant species indigenous to the locality but cultivated; alien to the locality and cultivated; or alien to the locality and spontaneous		
Vegetation cover classes		**Class 0:** **RESIDUAL BARE**	**Class I:** **RESIDUAL**	**Class II:** **MODIFIED**	**Class III:** **TRANSFORMED**	**Class IV:** **REPLACED -ADVENTIVE**	**Class V:** **REPLACED -MANAGED**	**Class VI:** **REMOVED**
		Areas where native vegetation does not naturally persist	Native vegetation community structure, composition, and regenerative capacity intact —no significant perturbation from land use or land management practice. Class I forms the benchmark for classes II to VI	Native vegetation community structure, composition and regenerative capacity intact—perturbed by land use or land management practice	Native vegetation community structure, composition and regenerative capacity significantly altered by land use or land management practice	Native vegetation replacement—species alien to the locality and spontaneous in occurrence	Native vegetation replacement with cultivated vegetation	Vegetation removed
Diagnostic criteria	Current regenerative capacity	Natural regenerative capacity unmodified—ephemerals and lower plants	Natural regenerative capacity unmodified	Natural regeneration tolerates or endures under past and or current land management practices	Natural regenerative capacity limited or at risk under past and or current land use or land management practices. Rehabilitation and restoration possible through modified land management practice	Regeneration of native vegetation community has been suppressed by ongoing disturbances of the natural regenerative capacity; limited potential for restoration	Regeneration of native vegetation community lost or suppressed by intensive land management; limited potential for restoration	Nil or minimal
	Vegetation structure	Nil or minimal	Structural integrity of native vegetation community is very high	Structure is predominantly altered but intact, e.g. a layer or strata and or growth forms and or age classes removed	Dominant structuring species of native vegetation community significantly altered, e.g. a layer or strata frequently removed	Dominant structuring species of native vegetation community removed or predominantly cleared or extremely degraded	Dominant structuring species of native vegetation community removed	Vegetation absent or ornamental
	Vegetation composition	Nil or minimal	Compositional integrity of native vegetation community is very high	Composition of native vegetation community is altered but intact	Dominant structuring species present—species dominance significantly altered	Dominant structuring species of native vegetation community removed	Dominant structuring species of native vegetation community removed	Vegetation absent or ornamental

Table 4: The evaluation of the SEI for the various vegetation communities and habitats present within and surrounding the PAOI (see Fig. 9).

Vegetation type	Conservation Importance (CI)	Functional Integrity (FI)	Receptor Resilience (RR)	Site Ecological Importance (SEI)
10m wetland buffer areas with closed canopy forest vegetation	**High** Confirmed threatened species.	**High** Good habitat connectivity, limited road network.	**Medium** VAST Class II: MODIFIED. Habitat will recover slowly with species that have a moderate likelihood to return to the site following disturbance.	**High** BI – High RR –
The Diepwalle hiking trail and Afrotemperate forest	**High** Confirmed threatened species.	**Very High** High habitat connectivity, limited road network.	**Medium** VAST Class I: RESIDUAL. Habitat will recover slowly with species that have a moderate likelihood to return to the site following disturbance.	**High** BI – Very High RR –
The frog pond	**High** Confirmed threatened species.	**High** Good habitat connectivity, limited road network.	**Medium** VAST Class II: MODIFIED. Habitat will recover slowly with species that have a moderate likelihood to return to the site following disturbance.	**High** BI – High RR –
The seasonal ant temporary wetland, 10m buffer areas with open canopy vegetation	**Medium** > 50% of receptor contains natural habitat with potential to support SCC.	**High** Good habitat connectivity, limited road network.	**Medium** VAST Class II: MODIFIED. Habitat will recover slowly with species that have a moderate likelihood to return to the site following disturbance.	**Medium** BI – Medium RR –
The Open muddy vegetation and Forest informal road	**Low** No confirmed or highly likely populations of SCC.	**High** Good habitat connectivity, limited road network.	**Medium** VAST Class III: TRANSFORMED. Habitat will recover slowly with species that have a moderate likelihood to return to the site following disturbance.	**Medium** BI – Medium RR –

Table 5: Mitigation measures for the site based on the SEI ratings of the various vegetation types present on the site.

Site Ecological Importance (SEI)	Interpretation in relation to the proposed development activities
High	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Changes to the project layout has already been considered multiple times during the course of 2023, which is important as the tents will be in the forest which is given a High SEI rating.
Medium	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities. Medium SEI areas are unfortunately no-go areas from an aquatic perspective (Dabrowski, 2023).

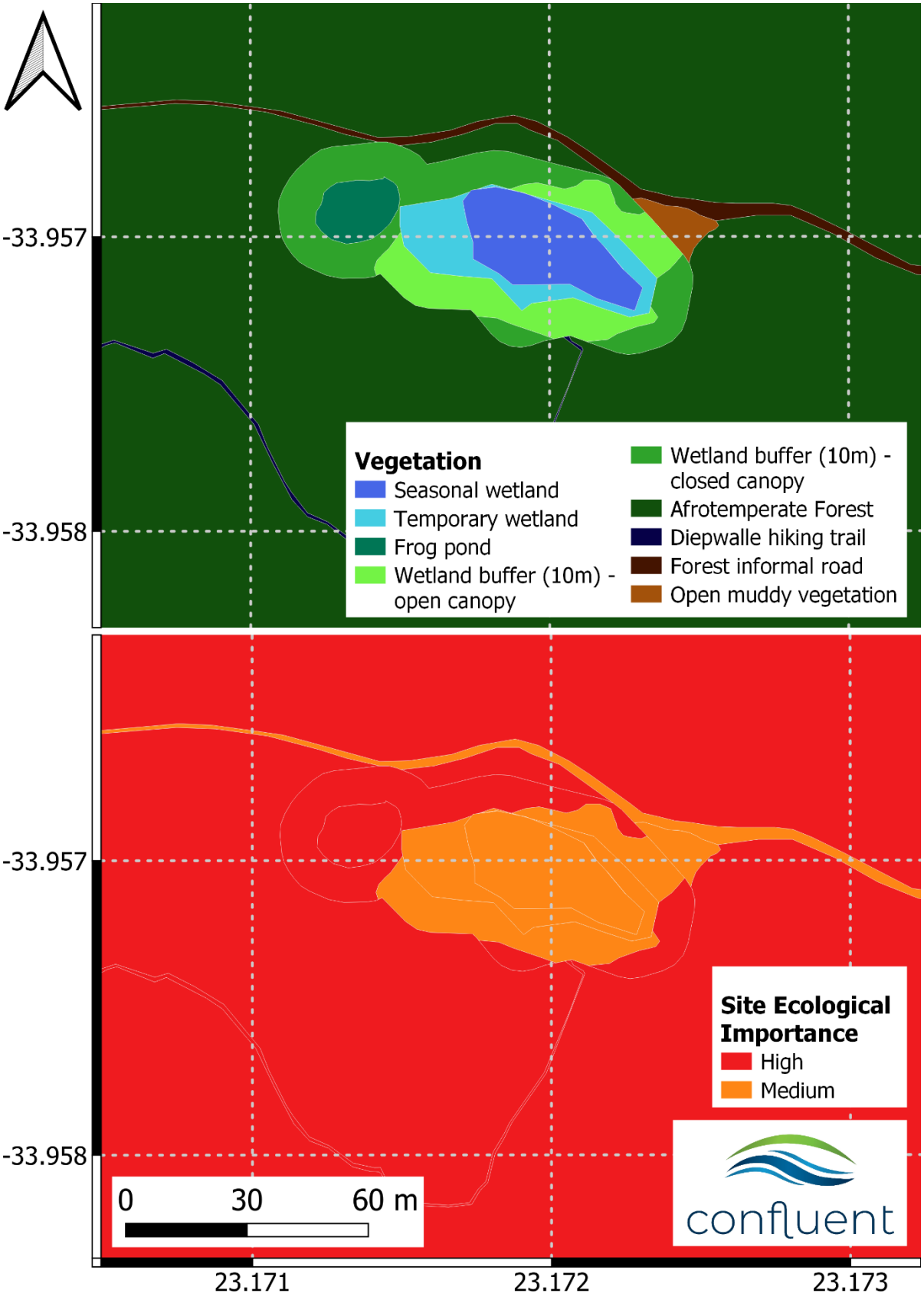

Figure 9: The refined vegetation map (top) with the site ecological importance (bottom).

8. IMPACT ASSESSMENT

The impact assessment for the proposed tented camp is based on methods that are provided in Appendix 11.4. Only one development option is presented in this impact assessment as numerous alternative layouts and plans have already been reviewed during the layout and design phase (in accordance with the mitigation hierarchy; Fig. 10). The option presented in this report is the best option for the environment thus far and is the only option that will be considered for the proposed luxury tented camp.

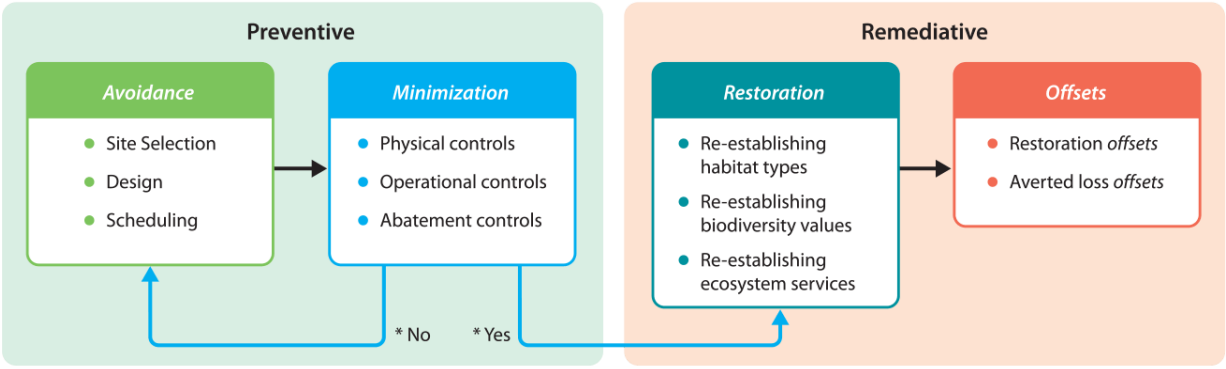

Figure 10: The iterative process of avoiding and minimising the predicted impacts on biodiversity and ecosystem services, as described in (Ekstrom et al., 2015).

8.1 Current impacts on the site

A summary of the current impacts on the site are as follows:

- The overgrown *Helichrysum spp*. in the clearing is limiting the ecological function of the vegetation there, and also prevents large animal movement through the clearing. However, smaller vertebrates may enjoy the cover (e.g., rodents, snakes, frogs, mongoose). Despite this, the helichrysum is overgrown and in a modified secondary state. The clearing would benefit from more native wetland plant species and thinning of the *Helichrysum spp*. in some areas.
- Invasive species in the clearing are established in some places. The invasive species found in the clearing were not present in the forest, and this should continue to be monitored.
- Hiking paths in the forest have s small (likely negligible) negative impact of the forest habitat.

8.2 Construction phase

An Environmental Control Officer (ECO) must be appointed for the duration of the construction phase. A botanist (e.g., author of this report) must be present on the site when the initial layout of the tented camp will be done. This will ensure that sensitive trees and seedlings are marked and labelled within the development footprint and that stakeholders are aware of the plants they must look out for and / or plan around. The main added disturbance during construction will be added traffic by heavier than usual vehicles for offloading materials and providing construction services. The anticipated impacts and mitigation measures that relate to the botanical diversity of the site are discussed below.

8.2.1 A loss of SCC and other delicate species (e.g., mosses) caused by vegetation clearance, site management practices, and disturbance during the construction phase.

Description:

The proposed tented camp construction and preparation will inevitably result in some vegetation loss and disturbance, especially within the forest habitat and within sections of the forest edge that falls within the delineated wetland buffer area (Dabrowski, 2023). Transport of materials and staff will negatively affect the vegetation and soil of the clearing and forest. Understory trees and other smaller species like mosses are especially vulnerable. This impact will be exacerbated during rainfall periods. Furthermore, the removal of rotting material in the forest environment may also affect vegetation growth during the construction phase. The forest is a refuge for several SCC and protected tree species, and planning around some of the larger trees will happen. The significance of this impact (see Table 6) without mitigation is Moderate – negative and Minor – negative with mitigation, as illustrated in Table 6.

The following consequences may occur due to this impact if mitigation is poor:

1. A loss of forest and wetland habitat.
2. Fragmentation of SCC sub-populations.
3. Reduction in the extent of occurrence (EOO) of SCC.
4. A general loss of suitable habitat for SCC and other species present on the site.
5. A loss of genetic variation within remaining SCC and other plant species stands.
6. A shift towards a negative change in the conservation status of the SCC and other indigenous species affected by the development.
7. An increased risk of invasion of the site by invasive species, and the consequent permanent loss of SCC some areas.
8. Potential health and safety hazards on the site and in the surrounding environment.

Mitigation measures:

1. A plant search and rescue must be conducted.
    a. The construction area of influence must be clearly delineated, and a botanist must be present during this initial construction plan to point out and mark important trees and plants within the forest environment.
    b. All new staff must be briefed about the layout of the construction site and must be made aware of the no-go areas and fact that the surrounding environment is sensitive and must not be disturbed.
    c. Rescued seedlings and smaller plants must be kept in a nursery on Diepwalle for the duration of the construction phase, where the plants will be cared for the nursery staff that already have long-term experience working with forest species in Knysna.
    d. Any additional SCC plants that are observed later of during construction within the development footprint must be rescued and added to the rescued plants in the nursery.
    e. Plants that were rescued and that can't be re-used in the development footprint after construction must be donated to an indigenous nursery or must be used by Diepwalle and SANParks in other forest restoration projects in the Knysna forest.

2. Materials used during construction must be sourced and transported responsibly to minimise the risk of contamination and pollution of the site.
    a. No waste dumping or burning is to be allowed on the site or in the surrounding environment. All material waste is to be collected in designated bins and must be transported to a waste disposal facility.
    b. Stockpiles and soil must all be covered by a geotextile or plastic covering, which must also be bunded (e.g., sandbags) when the piles are not in use on the site (Fig 11). This will prevent the material from washing away and contaminating the substrate of the site which likely still contains useful seeds and soil organisms.
    c. Where vegetation will be cleared to make way for construction, a temporary ground net / cover should be placed to prevent potential erosion. The ground cover must be sterilised and washed prior to bringing it to the sites, as there is a serious risk to the vegetation here from invasive plant species.
    d. Material preparation (e.g., woodcutting and drilling etc.) must not be done on the proposed camp site.

1. Protection and re-use of topsoil.
    a. The topsoil on the site contains valuable seeds and characteristics that will be vital for the success of rehabilitation of the site following construction processes. Topsoil excavated for the proposed mid-span option must therefore be treated with care.
    b. Topsoil in new excavation areas must be stripped to a depth of ca. 30cm and kept in designated piles on site within the footprint of the existing servitude road.
    c. Topsoil may not be removed from the site at all, to avoid contamination with any other material. Equipment used to handle and excavate the soil must be clean of any foreign material.
    d. The topsoil piles must be clearly labelled so that it does not mix with subsoils excavated or any other construction material for the site.
    e. Topsoil piles must be covered with plastic sheeting for the duration of the construction phase.

Figure 11: An example of a protected stockpile (image from stormwaterhawaii.com).

3. The construction of boardwalks (Dabrowski, 2023):
    a. Holes for pole supports for boardwalks and platforms must preferably be dug using an auger or by hand to minimise the footprint of disturbance.

b. Small gaps (15 – 20mm) should be left between planks on the boardwalks to allow filtered light through so plants can still grow under the boardwalk.

c. Boardwalk sides should be left open to allow small animals to move in and out of the buffer area during quieter times.

d. Plants surrounding the work area will inevitably become trampled. Therefore, a maximum disturbance area of 2m either side of the deck and boardwalk is acceptable. However, wherever feasible steps should be taken to reduce the area disturbed.

4. Weather forecasts should be checked on a daily basis, and work must stop during and following rainfall events.
5. The road could be fenced off with simple danger tape. If the tape starts to crumble or if it is broken, it must be disposed of responsibly.

    a. Fencing the road will ensure that vehicles do not widen the road margins throughout the construction period.

    b. The parking area must also be fenced with construction netting and must be clearly indicated on the site.

    c. As per the aquatic specialist report (Dabrowski, 2023): "*All drivers and workers must be informed that the buffer and wetland beyond the danger tape is a 'No-go' area unless specifically working on construction of the communal platforms in the buffer or boardwalks along the buffer edge… If the road becomes very muddy and navigation becomes difficult, a combination of some / all of the following methods can be implemented: Improve drainage with cut off drains, low berms across the road, and shaping the road crowns to drain downstream; compact the base layer of and add a binding agent such as cement if necessary; add a surface layer of fractured stone, sand, and fine material and compact to a smooth surface. During construction, no cement must be mixed anywhere except on the road, and work must always take place during dry weather."* See the aquatic specialist impact assessment for further details on this.

6. Construction vehicles should be checked on a daily basis at the start of the day for leaks and other faults.

    a. Sandbags or sawdust should be available on the site to ensure that any accidental oil or toxic material spills can be contained and stopped quickly.

    b. Any contaminated soil on the site must be removed by a registered hazardous waste service provider (Spill Tech, Interwaste, EnviroServ etc.).

    c. Vehicles with leaks must not be allowed to operate on the site until they have been repaired.

7. Adequate ablution facilities must be provided for every construction project.

    a. Toilets must be placed on a level platform before construction starts.

    b. Ablution facilities must be regularly maintained and cleaned.

    c. At least one toilet per ten to fifteen construction staff should be available.

Table 6: Construction phase impact 1: A loss of SCC and other delicate species (e.g., mosses) caused by vegetation clearance, site management practices, and disturbance during the construction phase.

Assessment	Without mitigation	With mitigation
Nature	Negative	Negative
Intensity	Very High	Moderate
Duration	Short term	Brief
Extent	Limited	Very Limited
Probability	Certain	Certain
Confidence	High	High
Reversibility	Low	Low
Resource irreplaceability	High	High
Significance	**Moderate negative Score: -77**	**Minor negative Score: -49**

8.2.2 SCC seedlings and other species (e.g., orchids) negatively affected by an increased potential for poaching & IAP introduction during the construction phase of the project.

Description:

Ornamental plants, geophytes and epiphytic orchids are at a large risk of poaching. Some LC species, especially geophytes, can also be targeted by plant poachers, like the species that were observed within the development footprint. Human activity can also lead to an increased likelihood and risk of invasive plant spread and establishment in a natural ecosystem. The significance of this impact (see Table 7) without mitigation Minor – negative and with mitigation it should be Negligible - negative.

The following consequences may occur due to this impact:

1. The creation of novel habitat that indigenous species cannot survive in, but where exotics and invasive plants thrive in.
2. A loss of SCC and other indigenous plant stands leading to a loss of population resilience or local extinction.
3. Abuse of natural assets for material gain.

Mitigation measures:

1. Staff must be told that the environment is sensitive, but care must be taken **not** to point out individual potentially ornamental plant species, such as the EN tree seedlings, tree orchids and mosses. Instead, staff must be aware of no-go areas and must be informed that no biological material may be removed from the site unless it is part of management of the site.
2. Ongoing monitoring and clearing of invasive plants on the site should occur. This is a requirement by law.
3. No kikuyu grass (*Cenchrus clandestinus*) will be allowed anywhere, as this is a listed invasive species. This invasive species was not observed on the site, but it is still available at commercial nurseries, however it must never be used.

Table 7: Construction phase impact 1: A loss of SCC and other delicate species (e.g., mosses) caused by vegetation clearance and disturbance within the footprint of the project.

Assessment	Without mitigation	With mitigation
Nature	Negative	Negative
Intensity	High	Very Low
Duration	Short term	Immediate
Extent	Limited	Very Limited
Probability	Likely	Rare
Confidence	High	High
Reversibility	Low	Low
Resource irreplaceability	High	High
Significance	**Minor negative** **Score: -50**	**Negligible negative** **Score: -8**

8.3 Conclusion of construction

The conclusion of any project is an essential, but often overlooked aspect of projects. This relates primarily to the cleaning up of the site once construction has concluded.

1. All of the mitigation measures for mitigation proposed above are only meaningful if construction is properly concluded.
2. Construction sites must be cleared of all waste material, rubble, and debris associated with the construction phase at regular intervals during, and at the conclusion of the construction phase.
3. Revegetation of bare soil following construction is an essential part of concluding the construction phase of the project.
4. Drainage structures must be checked to ensure that there are no blockages or pollution that is blocking the free flow of water over the site; erosion during and after the construction phase that could have potentially far-reaching implications beyond the PAOI and must be avoided by proper site management and organisation.

8.4 Operational phase

8.4.1 SCC seedlings and other species (e.g., orchids) negatively affected by an increased potential for poaching from both guests and staff.

Description:

As mentioned, numerous plant species in South Africa, across a wide range of habitat types, are prone to poaching and abuse. Plant poaching includes both SCC and non-SCC plants. This problem is well known, and SANBI has tried to protect the identity of some Threatened species by obscuring their true identities (i.e., all the "Sensitive Species" listed by SANBI). Without mitigation, the impact of poaching will be cumulative over time, making the impact worse as more plants are poached from the environment. This is an impact that, if it happens, can have potentially cumulative negative effects for the biodiversity of the site. Without mitigation poaching during the operational phase of the project is likely to have a Minor - negative impact (which can become a greater impact if the problem persists for long enough), and with appropriate mitigation the problem is a Negligible – negative impact (Table 8).

The following consequences may occur due to this impact:

1. Increased problem with illegal sale of indigenous plants that have been poached.
2. A loss of species diversity and overall health in the surrounding environment.
3. A negative shift towards a degradation of portions of the surrounding sensitive landscape where some places become dominated by graminoids and essentially become dominated by "non-native vegetation cover" over enough time.

Mitigation measures:

1. The access road to the proposed Camp site must be kept locked at all times when guests and staff are not making use of it.
2. Diepwalle management can strategically monitor the plants within and nearby the camp to ensure that any loss of plants are due to natural causes and not poaching or bark stripping.
3. Camera traps can be setup in the forest around the campsite. This can help to catch potential poachers and also help to monitor wildlife around the campsite during the year.
4. Guests to the camp must be informed that no plant material may be removed from the site, but guests do not need to know exactly which species are vulnerable to poaching.
5. Diepwalle can include information in the camp information folders stating the legal implications of plant poaching.
6. Guests may not enter the camp with flower presses.
7. All staff and guests must be made aware that the wetland area and forest are sensitive habitats and that they are not allowed to access any areas that are not clearly marked as paths or boardwalks.

Table 8: SCC seedlings and other species (e.g., orchids) negatively affected by an increased potential for poaching from both guests and staff.

Assessment	Without mitigation	With mitigation
Nature	Negative	Negative
Intensity	Moderate	Very low
Duration	Permanent	Immediate
Extent	Limited	Very limited
Probability	Likely	Rare
Confidence	High	High
Reversibility	Low	Low
Resource irreplaceability	High	High
Significance	**Minor negative** **Score: -65**	**Negligible negative** **Score: -8**

8.4.2 SCC are negatively affected by maintenance activities, e.g., tree trimming & rotting vegetation removal.

Description:

The proposed camp, which will mostly sit within forest vegetation, will be in close proximity to Red Listed plant species that are vulnerable due to threats and habitat loss. The species in the camp area will be subject to an altered disturbance regime. If the management of the camp site in the long-term is done in an ecologically friendly way the impacts of management in the area can be positive, but without the appropriate consideration for the environment management activities could impact the flora (i.e., habitat) 0f the site negatively. Without the appropriate mitigation in place, site management could have a Minor - negative effect on the vegetation surrounding the camp, and with mitigation the impact will be Negligible – positive (Table 9). The positive impact will be from vegetation management that allows more native plant diversity to return in the wetland area.

The following consequences may occur due to this impact:

1. A general loss of habitat for plants, pollinators, and other important taxa.
2. Altered soil characteristics which causes unnecessary harm to forest vegetation dynamics.
3. Pollution of the environment.
4. The creation of a landscape of fear where some animals and insects that are able to access the site do not do so because of excessive and potentially destructive anthropogenic activity.

Mitigation measures:

1. It is a requirement of the law that alien clearing and monitoring according to an alien eradication plan be followed on the site.
2. As mentioned in the aquatic report, no insect zappers or insecticides are allowed in the camp. For mosquitoes guests and staff will be allowed to apply deterrent lotions.
3. Emergency & cleaning supplies for incidents of waste spillage, or fires accidentally spreading should be kept on the camp (e.g., keep lime, spades, first aid etc. handy). Fire extinguishers etc. must be kept on the camp as per fire safety regulations.

4. Staff on the site must be properly trained and guests must be well aware of activities that are not allowed on the site.
    a. No staff member is allowed to dispose of grey water in the natural wetland or forest environment.
    b. Grey water disposal on the site must be in accordance with the following recommendation as clarified by Marteha Alant: two existing slip paths are to be used for grey water disposal with soakaways to deal with the grey water in the concession area and prevent grey water from spreading elsewhere. The kitchen will have fat traps with only biodegradable soap. Greasy dishes can be washed on the existing Diepwalle tea garden (i.e., off-site).
    c. No member of staff or guest is allowed to walk where a path is not clearly labelled or outside of roads and boardwalks.
    d. Instructions for the proper use of chemical toilets must be provided and must be clearly visible in all restrooms.
5. No plants may be brought to the site from elsewhere. All species present on the camp site must be from the plant rescue or are species that occur there naturally.
    a. Plants of the same species as those found within the Diepwalle proposed camp area may not be planted unless they were part of the plant search and rescue. This is to prevent genetic mixing of different populations.

i. However, wetland plants may be sourced from elsewhere to help restore some additional diversity within the wetland area. This mitigation will allow this impact to become a positive for the environment after mitigation. Some examples of wetland plants that may be considered are (bold species were found on the site; they can be rescued from the roadsides and cultivated for later maintenance activities):

Carex aethiopica, Carex uhligii, Cyperus congestus , C. polystachyos , *Juncus dregeanus, J. effusus,* and ***J. lomatophyllus.***

Table 9: Operational phase impact 1: SCC are negatively affected by maintenance activities, e.g., trimming & rotting vegetation removal.

Assessment	Without mitigation	With mitigation
Nature	Negative	Positive
Intensity	Low	Low
Duration	Brief	Immediate
Extent	Limited	Very limited
Probability	Certain	Certain
Confidence	High	High
Reversibility	Low	Low
Resource irreplaceability	High	High
Significance	**Minor – negative** **Score: -49**	**Negligible – positive** **Score: 28**

8.5 Decommissioning Phase

8.5.1 SCC seedlings and other species (e.g., orchids) negatively affected by the removal of equipment and some infrastructure from the Diepwalle camp before the off season (i.e., Winter)

Description: The camp will be partially packed away during the winter every year. The aquatic report (Dabrowski, 2023) states: "*It is understood that all moveable items will be removed from the site, but built structures such as the boardwalk, decks and pools would be left in place. The pools are the main concern as they must be secured against wildlife falling into them and becoming trapped, and against filling up with water …When the site is reconstructed for the tourist season, all construction phase impact mitigation measures are once again applicable.*" Before mitigation this impact is Minor - Negative and after it is Negligible – Negative (Table 10).

The following consequences may occur due to this impact:

1. An unnecessary loss of general diversity, especially plants, including SCC.
2. Pollution of the environment.
3. A shift to a negative conservation status pf SCC and LC species.
4. A loss of habitat and the creation of fragmented & novel habitats within the forest and wetland.

Mitigation measures:

1. The removal of items from the site must be approached with the same caution and care as was recommended for the construction phase.
    a. Vehicles must stick to the road and must not be overloaded (risk of mud creation & erosion is high).
    b. The weather must be watched, and no removal will be allowed during rainy periods and following rainfall events.
    c. The forest and wetland vegetation outside of the camp and boardwalks are no-go areas.
2. Most of the boardwalks must be left on the site to minimise disturbance to the vegetation and sensitive aquatic features of the site. However, strategic sections of the boardwalk may be removed to allow for animal movement between the forest and clearing (see Fig. 12 for an example of a modular boardwalk design).

Figure 12: An image of a "modular aluminium boardwalk", as an example of a lightweight board walk design where sections of the flat boardwalk can be easily removed from the site. This is an American company (greatnortherndocks.com), but a similar concept can be applied for the proposed tented camp at Diepwalle.

Table 10: Decommissioning phase impact 1 - SCC seedlings and other species (e.g., orchids) negatively affected by the removal of equipment and some infrastructure from the Diepwalle camp before the off season (i.e., Winter)

Assessment	Without mitigation	With mitigation
Nature	Negative	Negative
Intensity	Moderate	Very low
Duration	Immediate	Immediate
Extent	Limited	Very limited
Probability	Certain	Certain
Confidence	High	High
Reversibility	Low	Low
Resource irreplaceability	High	High
Significance	**Minor negative** **Score: -49**	**Negligible negative** **Score: -28**

9. CONCLUSION

The proposed luxury tented camp in the Diepwalle forest near Knysna was assessed in terms of the botanical and vegetation present within the proposed site development footprint. The camp will make use of the existing SANParks facilities for the bulk of their preparation and storage, as this will greatly reduce the size of the impact and traffic that moves to and from the proposed camp site. The current existing road that leads to the proposed camp will be the main access for the campsite. The proposed development will impact on two main vegetation unite, namely the helichrysum dominated wetland clearing and the surrounding Afrotemperate Forest habitat. The wetland is likely a relic of historical woodcutting and clearing and the pool (within the forest) on the site was also excavated by people in the past. The main species of conservation concern were two tree species, which are also protected national tree species. These were *Curtisia dentata* (NT), and *Ocotea bullata* (EN). Additionally, two more nationally protected tree species were found that are not on the South African Red List, namely *Afrocarpus falcatus* (the Outeniqua yellowwood) and *Podocarpus latifolius* (the real yellowwood). *P. latifolius* was the most common of all of the protected trees on the site. Two orchid species (both LC) were also recorded in the forest habitat, one of which was an epiphytic tree orchid and the other one was a geophyte ground orchid. Several special moss species were also seen forming mush mats in the forest.

All of these plants are essential for the forest micro-environment, and care must be taken to avoid enlarging the construction footprint beyond the 2m disturbance strip around the camp features that need to be installed. Mitigation measures for the proposed luxury camp was provided in the impact assessment for the construction, operational, and decommissioning phases. From a botanical perspective, the development of the camp is acceptable in the mitigation measures provided in this report, as well as all other specialist reports, are implemented. The forest environment has a high botanical sensitivity according to the protocols, and it also has a high site ecological importance according to the species environmental assessment guideline report (Verburgt et al., 2020). The development of a camp in the forest area in order to avoid the sensitive aquatic features (i.e., the wetland clearing) is supported as long as it is dome in an ecologically conscious manner, which starts with the implementation of the mitigation proposed.

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11. APPENDIX

11.1 Provisional plant species list

All species that were observed during the site visit are in Table 11. A species accumulation curve for all the species recorded on the site during the assessment are presented in Fig. 13.

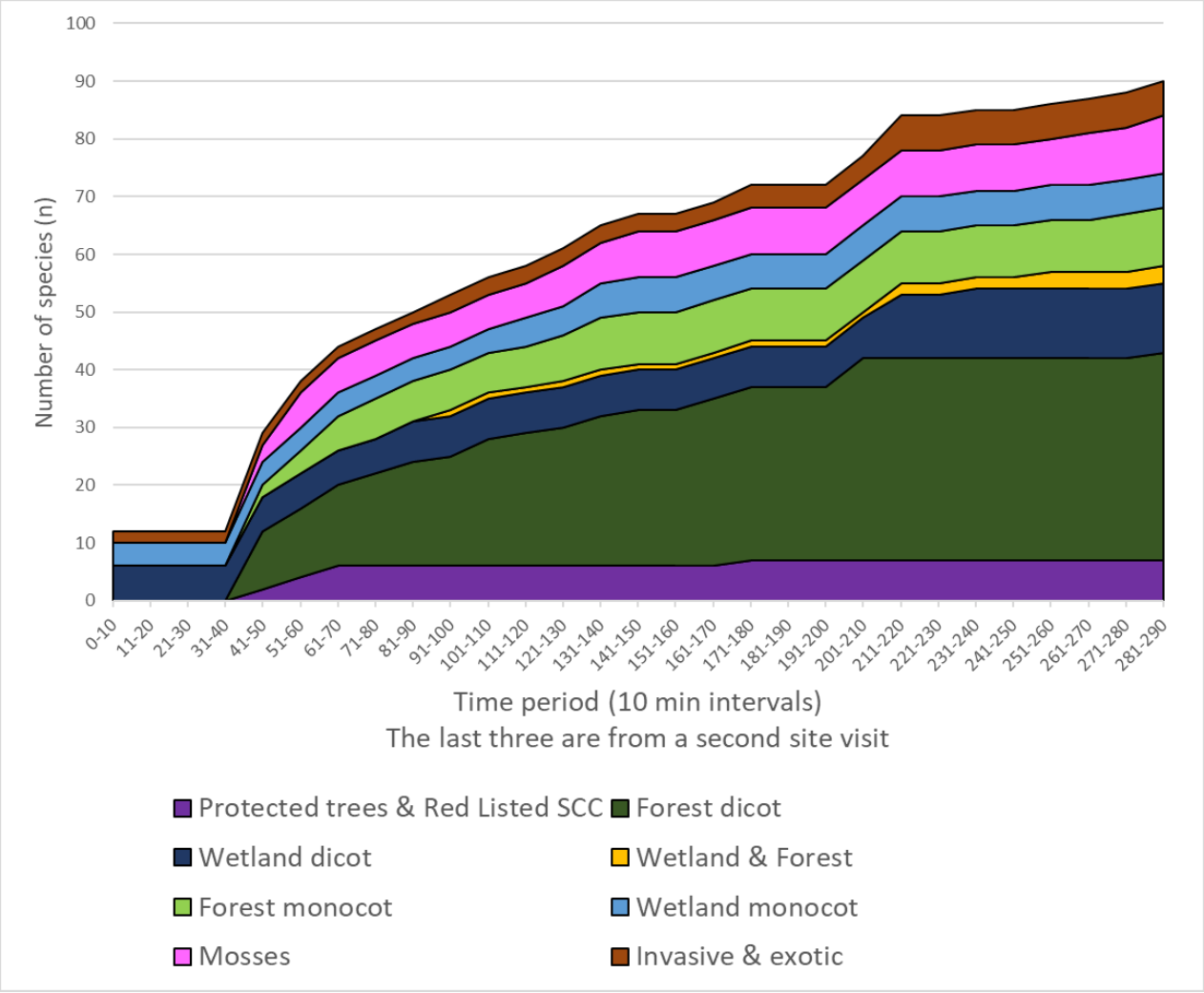

Figure 13: A plant species accumulation curve for the site assessment.

Table 11: A species list for the Diepwalle site assessment. Red entries indicate exotic naturalised and invasive species, green entries indicate threatened species (on the Red List), and yellow entries are protected tree species that are LC.

Family	Species name	Common name	Habitat	Observer
Bryopsida & Polytrichopsida (Mosses)				
Rhizogoniaceae	*Pyrrhobryum spiniforme*	Moss species	Forest	Bianke Fouche
Polytrichaceae	*Atrichum androgynum*	Long Smoothcap	Forest	Bianke Fouche
Liliopsida (Monocots)				
Asparagaceae	*Asparagus scandens*	Climbing asparagus	Forest	Bianke Fouche
Cyperaceae	*Carex aethiopica*		Forest	Bianke Fouche
Cyperaceae	*Carex uhligii*	Forest Sedge	Forest	Bianke Fouche
Cyperaceae	*Cyperus congestus*	Purple Umbrella Sedge	Wetland	Bianke Fouche
Cyperaceae	*Cyperus polystachyos*	flatsedges	Wetland	Jackie Dabrowski
Iridaceae	*Aristea ecklonii*	Blue corn-lily	Forest & Wetland	Bianke Fouche
Iridaceae	*Dietes iridioides*	Small Fortnight Lily	Forest	Bianke Fouche
Juncaceae	*Juncus lomatophyllus*	Leafy Rush	Wetland	Jackie Dabrowski
Orchidaceae	*Angraecum pusillum*	White Dwarf Shell Orchid	Forest	Bianke Fouche
Orchidaceae	*Disperis lindleyana*	Forest Kappie	Forest	Bianke Fouche
Poaceae	*Axonopus sp.*	carpetgrasses	Wetland	Bianke Fouche
Poaceae	*Ehrharta erecta*	panic veldtgrass	Forest	Bianke Fouche
Poaceae	*Microstegium nudum*		Wetland	Bianke Fouche
Poaceae	*Oplismenus hirtellus*	Basket Grass	Forest	Bianke Fouche
Poaceae	*Paspalum urvillei*	Vasey Grass	Wetland	Bianke Fouche
Magnoliopsida (Dicots)				
Apiaceae	*Centella asiatica*	Gotu Cola	Forest & Wetland	Bianke Fouche & Jackie Dabrowski
Apocynaceae	*Gomphocarpus fruticosus fruticosus*	Wild Cotton	Wetland	Bianke Fouche
Apocynaceae	*Gonioma kamassi*	Knysna Boxwood	Forest	Bianke Fouche
Apocynaceae	*Secamone alpini*	Monkey Rope	Forest	Bianke Fouche
Aquifoliaceae	*Ilex mitis mitis*	Common Cape Holly	Forest	Bianke Fouche
Asteraceae	*Gerbera cordata*	Forest Gerbera	Forest	Bianke Fouche
Asteraceae	*Helichrysum cymosum*	Fume Everlasting	Wetland	Bianke Fouche
Asteraceae	*Helichrysum petiolare*	Licorice plant	Wetland	Bianke Fouche
Asteraceae	*Hypochaeris radicata*	Common Cat's-ear	Wetland	Bianke Fouche
Asteraceae	*Senecio deltoideus*	Climbing Ragwort	Forest	Bianke Fouche
Asteraceae	*Seriphium plumosum*	Bankrupt Bush	Wetland	Bianke Fouche
Campanulaceae	*Lobelia flaccida*	Floppy Lobelia	Wetland	Bianke Fouche

Celastraceae	*Elaeodendron croceum*	Forest Saffron	Forest	Bianke Fouche
Celastraceae	*Gymnosporia nemorosa*	White Forest Spikethorn	Forest	Bianke Fouche
Celastraceae	*Pterocelastrus tricuspidatus*	Candlewood	Forest	Bianke Fouche
Celastraceae	*Robsonodendron eucleiforme*	False Silkybark	Forest	Bianke Fouche
Crassulaceae	*Crassula sarmentosa*	Succulent species	Forest & Wetland	Bianke Fouche & Jackie Dabrowski
Curtisiaceae	*Curtisia dentata*	Assegai tree	Forest	Bianke Fouche
Ebenaceae	*Diospyros whyteana*	Bladder Nut	Forest	Bianke Fouche & Jackie Dabrowski
Ericaceae	*Erica sparsa*	Spartan Heath	Wetland	Bianke Fouche
Fabaceae	*Acacia stricta*	Hop wattle	Wetland	Christopher Brooke
Fabaceae	*Schotia afra*	Karoo Boerbean	Forest	Bianke Fouche
Haloragaceae	*Laurembergia repens*		Wetland	Bianke Fouche
Hamamelidaceae	*Trichocladus crinitus*	Onderbos	Forest	Bianke Fouche
Icacinaceae	*Cassinopsis*		Forest	Bianke Fouche
Icacinaceae	*Pyrenacantha scandens*		Forest	Bianke Fouche
Lauraceae	*Ocotea bullata*	Stinkwood	Forest	Bianke Fouche
Meliaceae	*Ekebergia sp.*		Forest	Bianke Fouche
Menispermaceae	*Cissampelos torulosa*		Forest	Bianke Fouche
Ochnaceae	*Ochna sp.*		Forest	Bianke Fouche
Oleaceae	*Olea capensis*	Black Ironwood	Forest	Bianke Fouche
Oleaceae	*Olea capensis macrocarpa*	Ironwood	Forest	Bianke Fouche
Onagraceae	*Oenothera sp.*	evening primroses, sundrops, and beeblossoms	Forest	Bianke Fouche
Oxalidaceae	*Oxalis incarnata*	Pale pink-sorrel	Forest	Bianke Fouche
Penaeaceae	*Olinia ventosa*	Hard pear	Forest	Bianke Fouche
Peraceae	*Clutia affinis*		Wetland	Bianke Fouche
Piperaceae	*Peperomia retusa*	Wild Peperomia	Forest	Bianke Fouche
Piperaceae	*Peperomia tetraphylla*	acorn peperomia	Forest	Bianke Fouche
Plantaginaceae	*Plantago lanceolata*	ribwort plantain	Wetland	Bianke Fouche
Polygonaceae	*Persicaria decipiens*	slender knotweed	Wetland	Jackie Dabrowski
Primulaceae	*Rapanea melanophloeos*	Cape beech	Forest	Bianke Fouche
Ranunculaceae	*Knowltonia vesicatoria*	Common Burnleaf	Forest	Bianke Fouche
Rhamnaceae	*Rhamnus prinoides*	Shiny leaf	Forest & Wetland	Bianke Fouche & Jackie Dabrowski

Rhamnaceae	*Scutia myrtina*	cat-thorn	Forest	Bianke Fouche
Rosaceae	*Agrimonia bracteata*	Agrimonie	Wetland	Bianke Fouche & Jackie Dabrowski
Rosaceae	*Rosa rubiginosa*	Sweet brier	Wetland	Bianke Fouche
Rosaceae	*Rubus affinis*	Vigorous Bramble	Wetland	Bianke Fouche
Rubiaceae	*Afrocanthium mundianum*	Rock Alder	Forest	Bianke Fouche
Rubiaceae	*Canthium inerme*	Turkeyberry	Forest	Bianke Fouche
Rubiaceae	*Psydrax obovata*	Inland Pioneer Quar	Forest	Bianke Fouche
Rutaceae	*Zanthoxylum davyi*	Forest Knobwood	Forest	Bianke Fouche
Salicaceae	*Trimeria grandifolia*	Roundleaf Wild-Mulberry	Forest	Bianke Fouche
Scrophulariaceae	*Selago corymbosa*	Stiff Bitterbush	Wetland	Bianke Fouche
Stilbaceae	*Halleria lucida*	African honeysuckle	Forest	Bianke Fouche
Stilbaceae	*Nuxia floribunda*	Forest Elder	Forest & Wetland	Bianke Fouche
Urticaceae	*Laportea aestuans*	West Indian woodnettle	Wetland	Bianke Fouche
	Magnoliopsida	dicots	Forest	Bianke Fouche
		Pinopsida		
Podocarpaceae	*Afrocarpus falcatus*	Outeniqua yellowwood	Forest	Bianke Fouche
Podocarpaceae	*Podocarpus latifolius*	real yellowwood	Forest	Bianke Fouche
		Polyopsida		
Blechnaceae	*Blechnum capense*	Cape Hard Fern	Forest	Bianke Fouche
Blechnaceae	*Blechnum punctulatum*	Glossy Hard Fern	Forest	Bianke Fouche
Dryopteridaceae	*Polystichum sp.*	shield ferns	Forest	Bianke Fouche
Dryopteridaceae	*Rumohra adiantiformis*	leatherleaf fern	Forest	Bianke Fouche
Pteridaceae	*Cheilanthes viridis*	Green Cliff Brake	Forest	Bianke Fouche

11.2 Land use recommendations according to the WC BSP

Recommended acceptable land-uses for each BSP layer is outlined and summarised in Table 12 below.

Table 12: The land-use planning proposed by the Western Cape Biodiversity Spatial Plan

LAND USE CATEGORIES		Conservation		Agriculture		Tourism and Recreational Facilities		Rural Accomodation		Urban			Business & Industrial				Infrastructure Installations			
LAND USE SUB-CATEGORIES (Refer to table 4.7 for descriptions)		Proclaimed Protected Areas	Other Nature Areas	Intensive Agriculture	Extensive Agriculture	Low Impact Facilities	High Impact Facilities	Agri-worker Accommodation	Small holdings	Urban Development & Expansion	Community Facilities & Institutions	New Settlements	Rural Business	Non-place-bound Industry (low-moderate impact)	Non-place-bound Industry (high impact)	Extractive Industry (incl. Prospecting)	Linear - roads & rail	Linear - pipelines & canals	Linear - powerlines	Other Utilities
MAP CATEGORY	DESIRED MANAGEMENT OBJECTIVE	Y = Yes: Permissible land uses that are not likely to compromise the biodiversity objective						R = Restricted: Land uses that may compromise the biodiversity objective are only permissible under certain conditions (refer to Table 4.7 for conditions)					N = No: Land uses that will compromise the biodiversity objective and are not permissible							
Protected Area	Must be kept in a natural state, with a management plan focused on maintaining or improving the state of biodiversity.	Land use within proclaimed protected areas are subject to management plan drawn up for that specific protected area.																		
Critical Biodiversity Area 1	Keep natural, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land uses are appropriate.	Y	Y	N	R	N	N	N	N	N	N	N	N	N	N	N	N	N	R	N
Critical Biodiversity Area 2	Keep natural, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land uses are appropriate.	Y	Y	N	R	R	N	N	N	N	N	N	N	N	N	N	R	R	R	N
Ecological Support Area 1: Terrestrial	Maintain in a functional, near-natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised.	Y	Y	N	R	R	N	N	N	N	N	N	R	R	N	N	R	R	R	R
Ecological Support Area 1: Aquatic	Maintain in a functional, near-natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised.	Y	Y	N	R	R	N	N	N	N	N	N	N	N	N	N	R	R	R	N
Ecological Support Area 2	Restore and/or manage to minimise impact on ecological infrastructure functioning; especially soil and water-related services.	Y	Y	N	R	R	N	N	R	N	N	N	N	N	N	N	R	R	R	R
ONA: Natural to Near-Natural	Minimise habitat and species loss and ensure ecosystem functionality through strategic landscape planning. Offers flexibility in permissible land uses, but some authorisation may still be required for high impact land uses.	Y	Y	R	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
ONA: Degraded	Minimise habitat and species loss and ensure ecosystem functionality through strategic landscape planning. Offers flexibility in permissible land uses, but some authorisation may still be required for high impact land uses.	R	R	R	Y	Y	R	R	Y	R	R	R	R	R	R	R	Y	Y	Y	Y
No Natural Remaining	These areas are suitable for development but may still provide limited biodiversity and ecological infrastructure functions and should be managed in a way that minimises impacts on biodiversity and ecological infrastructure.	R	R	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

11.3 Site Ecological Importance Methods

The site ecological importance (SEI) assessment is a function of biodiversity importance (BI) and receptor resilience (RR), which is defined as:

> *"The intrinsic capacity of the receptor (i.e., habitat type in question) to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention."*

The function is as follows: SEI = BI + RR. BI is a function of conservation importance (CI) and habitat functional integrity (FI), so that BI = CI + FI. The definition of CI given by the Species Environmental Assessment Guideline of 2022 is:

> *"The importance of a site for supporting biodiversity features of conservation concern present, e.g., populations of IUCN threatened and Near Threatened species (CR, EN, VU and NT), Rare species, range-restricted species, globally significant populations of congregatory species, and areas of threatened ecosystem types, through predominantly natural processes."*

Most features included in CI are provided by the screening tool but needs to be evaluated at a finer scale from the field work assessment. FI is defined as:

> *"A measure of the ecological condition of the impact receptor as determined by its remaining intact and functional area, its connectivity to other natural areas and the degree of current persistent ecological impacts."*

The criteria for defining RR, CI and FI are provided in the Species Environmental Assessment Guidelines of 2022. BI can be derived from a simple matrix of CI and FI, as illustrated in Table 13 below.

Table 13: The matrix that defines the biodiversity importance (BI) of a given habitat type, as identified from a desktop and field assessment.

Biodiversity Importance		**Conservation Importance**				
		Very High	High	Medium	Low	Very Low
Functional Integrity	Very High	Very High	Very High	High	Medium	Low
	High	Very High	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very Low
	Low	Medium	Medium	Low	Low	Very Low
	Very Low	Medium	Low	Very Low	Very Low	Very Low

SEI can then be derived from a second matrix, as depicted in Table 14. SEI is specific to the proposed development and can therefore only be compared between alternative layouts for the same proposed development, but not between developments.

Table 14: The matrix that defines the site ecological importance (SEI) of a given habitat type, as identified from a desktop and field assessment.

Site Ecological Importance		**Biodiversity Importance**				
		Very High	High	Medium	Low	Very Low
Receptor Resilience	Very High	Very High	Very High	High	Medium	Low
	High	Very High	Very High	High	Medium	Very Low
	Medium	Very High	High	Medium	Low	Very Low
	Low	High	Medium	Low	Very Low	Very Low
	Very Low	Medium	Low	Very Low	Very Low	Very Low

11.4 Impact assessment methods

Individual impacts for the construction and operational phase were identified and rated according to criteria which include their intensity, duration, and extent. The ratings were then used to calculate the consequence of the impact which can be either negative or positive as follows:

Consequence *= type x (intensity + duration + extent)*

Where type is either negative (i.e., -1) or positive (i.e., 1). The significance of the impact was then calculated by applying the probability of occurrence to the consequence as follows:

Significance *= consequence x probability*

The criteria and their associated ratings are shown in Table 15.

Table 15: Categorical descriptions for impacts and their associated ratings.

Rating	Intensity	Duration	Extent	Probability
1	Negligible	Immediate	Very limited	Highly unlikely
2	Very low	Brief	Limited	Rare
3	Low	Short term	Local	Unlikely
4	Moderate	Medium term	Municipal area	Probably
5	High	Long term	Regional	Likely
6	Very high	Ongoing	National	Almost certain
7	Extremely high	Permanent	International	Certain

Categories assigned to the calculated significance ratings are presented in Table 16.

Table 16: Value ranges for significance ratings, where (-) indicates a negative impact and (+) indicates a positive impact.

Significance Rating	Range	
Major (-)	-147	-109
Moderate (-)	-108	-73
Minor (-)	-72	-36
Negligible (-)	-35	-1
Neutral	0	0
Negligible (+)	1	35
Minor (+)	36	72
Moderate (+)	73	108
Major (+)	109	147

Each impact was considered from the perspective of whether losses or gains would be irreversible or result in the irreplaceable loss of biodiversity of ecosystem services. The level of confidence was also determined and rated as low, medium, or high (Table 17).

Table 17: Definition of reversibility, irreplaceability, and confidence ratings.

Rating	Reversibility	Irreplaceability	Confidence
Low	Permanent modification, no recovery possible.	No irreparable damage and the resource isn't scarce.	Judgement based on intuition.
Medium	Recovery possible with significant intervention.	Irreparable damage but is represented elsewhere.	Based on common sense and general knowledge
High	Recovery likely.	Irreparable damage and is not represented elsewhere.	Substantial data supports the assessment

11.5 January 2024 updated site development plan

During the introduction to this project, it was stated that the SDP has undergone several layout revisions. The latest revision was provided after the completion of this report (Fig. 14)

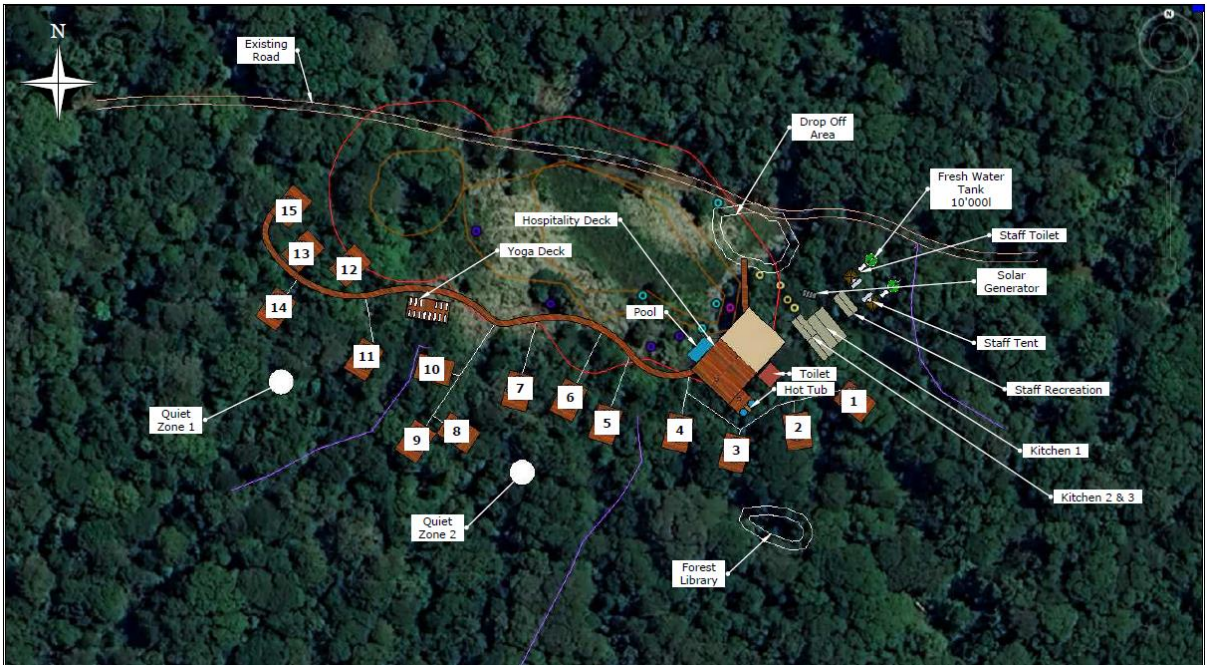

Figure 14: An illustration of the final SDP for the Diepwalle tented camp, as provided during January 2024.