

Alice Glockner Nature Reserve

Alice Glockner Nature Reserve is a small reserve of 168 hectares, situated approximately 6km to the south west of Suikerbosrand Nature Reserve. It is at an altitude of 1600 to 1700 metres above sea level.



The Alice Glockner property was bought by Mrs A M Schwelnus in 1964. She named the property after her mother and donated it to Fauna & Flora (now Gauteng Nature Conservation) in 1973 when it was proclaimed as a provincial nature reserve.

Alice Glockner Nature Reserve represents Highveld Grassland, of which only 0.8% is currently conserved in SA. Further, the reserve predominantly represents the priority Highveld Grassland type, Rocky Highveld Grassland, of which approximately only 2% is conserved in SA.

22 of the Red Data plant species that occur in Gauteng have been recorded in the Suikerbosrand Nature Reserve and surrounds, half of these being recorded in Heidelberg town area. 3 species have only ever been recorded from the Suikerbosrand-Alice Glockner complex (Gauteng endemics). 5 of the Red Data plant species recorded for the complex are ranked within the top 10 Red Data plant species for Gauteng . A recently described species, *Delosperma macellum* (Critically endangered) is also located at Alice Glockner Nature Reserve.

Fauna recorded for the Alice Glockner Nature Reserve include Duiker, Porcupine, Aardvark, Black backed jackal, Scrub hare, Mongoose, Meerkat, and Rock Hyrax. Approximately 56 bird species have been recorded on the reserve, including the Spotted Eagle Owl, and a relatively high diversity of Chat species. Approximately 20 species of reptiles and amphibians have also been recorded. Nevertheless, the reserve is still under surveyed to large degree.

Of cultural significance are the old mines and ruins that are situated in the reserve. Prospecting for gold was undertaken at Alice Glockner Nature Reserve in the past and the evidence of this is still apparent.

The Heidelberg Copper Butterfly (*Chrysoritis aureus*)

The Alice Glockner Nature Reserve is home to a rare and threatened (Red data) butterfly species, the Heidelberg Copper Butterfly (*Chrysoritis aureus*: *Vulnerable*). This butterfly was discovered on Christmas day in 1959 by two amateur collectors.

The Heidelberg Copper Butterfly is located primarily at the Alice Glockner Nature Reserve, and to a lesser extent at Suikerbosrand Nature Reserve and surrounding localities. These localities include the original locality at the Heidelberg Military Base where recent rehabilitation work by Gauteng Nature Conservation and the Military may prove to have put the butterfly back on the road to recovery at this site - future monitoring will confirm this.

This species is a Gauteng near-endemic and Alice Glockner Nature Reserve provides the stronghold for the butterfly and its required habitat. The butterfly is ant associated and requires one specific species of ant occurring on the reserve. This ant is one of approximately thirty species of ant that have been found on the reserve. It is estimated that there may be approximately five hundred individuals of the butterfly on the Alice Glockner Nature Reserve in a season.

As a highly sensitive species, *Chrysoritis aureus* (*C. aureus*) has extremely high conservation requirements. The Gauteng populations of *C. aureus* are fairly small in size and restricted to the unique habitats that their limited flexibility allows. Similar to other ant associated butterfly species, its lack of flexibility renders *C. aureus* highly sensitive to any disturbance in its habitat. The tolerance to physical stress in the adult stage is

low. Not only are the butterflies physically sensitive to chemical disturbance (pollution) but because they communicate by means of pheromones, are particularly sensitive to air-borne pollutants coming into the habitat area. Disturbance from adjoining areas will impact the habitat area in a number of ways including the potential introduction of the invasive Argentine ant that can out-compete local ant species in the habitat under disturbed conditions.

The larvae of *C. aureus* require protection from a single ant species, *Crematogaster liengmei*. The presence of the food plant, *Clutia pulchella* var. *pulchella*, is also absolutely vital for the survival of *C. aureus* colonies. The entire life cycle of *C. aureus* is confined to a single plant community, such as the early successional *C. pulchella* var. *pulchella* plant community present on the south facing rocky ridges of the Alice Glockner Nature Reserve.

The migration ability and rate of nomadism in *C. aureus* is very low. Therefore, rates of colonisation of newly created habitat or of re-establishment following extinction are also likely to be low. Nevertheless, genetic impoverishment is unlikely to be a principal factor influencing most populations of a few hundred individuals even if intermittent bottlenecks occur. Most extinction events will primarily be due to ecological or environmental pressures.

Habitat requirements of the Heidelberg Copper Butterfly, Chrysoritis aureus

- Early successional vegetation required, rich in plant species and flowering occurs over a longer period
- Montane rocky habitat 1600-1700m
- South facing rainshadow slopes where humus is shallow, soil drainage is high. The microclimate is dry, warm, stable and predictable. Precipitation is from the morning mist belt
- Butterfly life cycle host plant *Clutia pulchella*. The plants of specifically utilised are those that are apparently water stressed i.e. they are small & stunted, many branched, growing in dry well drained conditions. Larger plants of the species growing in wetter conditions further down the on the same slopes are not utilised by the butterfly despite the presence of the host ant.
- Adult butterfly food plants which include *Dianthus mooliensis*, *Aster peglerae*, *Senecio* sp., *Helichrysum* sp., *Walafrida* sp., *Tritonia nelsonii*, and others.
- Host ant *Crematogaster liengmei*

At least 16 medicinal plant species have been recorded on Alice Glockner Nature Reserve in association with the rare Heidelberg Copper Butterfly. The host plant that the butterfly requires for its life cycle, *Clutia pulchella*, is also a recorded medicinal plant.

Research continues on the Heidelberg Copper Butterfly (PhD study in progress; Gauteng Nature Conservation research and monitoring programme in progress) and this species represents a case study in a modelling research programme for invertebrate conservation. The research supports the suitability and necessity of small reserves for invertebrate conservation, and other faunal and floral conservation.

As the site of a rare ant associated butterfly species, Alice Glockner Nature Reserve represents unique habitat. The narrow niches occupied by ant-associated species are similar to those of a large range of other rare wildlife that inhabit unusual sites. It is possible that further rare invertebrate and plant species occur on the reserve, yet to be discovered.

Alice Glockner Nature Reserve is also characterised by high invertebrate diversity. This is significant in terms of biodiversity conservation, as invertebrates constitute an estimated 75% of all described species of fauna. A simple assessment of invertebrate diversity at the beginning of 1999 indicated that the Alice Glockner Nature Reserve was ten times more diverse than some other ridge areas in Gauteng. Some predators such as robber flies, which are considered to be a conspicuous and quantifiable indicator of invertebrate diversity, were recorded in abundance.