



## SANBI Biodiversity Series 13

# South African Red Data Book: butterflies

by

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## SANBI Biodiversity Series

The South African National Biodiversity Institute (SANBI) was established on 1 September 2004 through the signing into force of the National Environmental Management: Biodiversity Act (NEMBA) No. 10 of 2004 by President Thabo Mbeki. The Act expands the mandate of the former National Botanical Institute to include responsibilities relating to the full diversity of South Africa's fauna and flora, and builds on the internationally respected programmes in conservation, research, education and visitor services developed by the National Botanical Institute and its predecessors over the past century.

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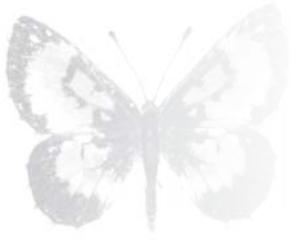
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# The Lepidopterists' Society of Africa

In 1983 a Lepidoptera study group of southern Africa was formed to promote an active exchange of knowledge about butterflies and moths. The study group became the Lepidopterists' Society of Southern Africa and by 1996 it became officially known as the Lepidopterists' Society of Africa (LepSoc). By this time, co-operative efforts encompassed the acquisition of knowledge about the Lepidoptera of the whole Afrotropical Region (Crosskey & White 1977). The major objectives of LepSoc are the scientific study of Lepidoptera in the Afrotropics, the publication of original scientific and popular material, the conservation of Lepidoptera, and the provision of infrastructure that promotes interactions between its members, as well as with wider society. The actions of the unique blend of amateur and professional members within LepSoc have resulted in a marked rise in both the public's appreciation of and the scientific community's interest in African butterflies and moths. Notable achievements of LepSoc during its short 25-year history include the establishment of four gazetted 'butterfly' reserves in South Africa, a quarterly specialist journal, *Metamorphosis*, a number of books of a scientific nature, and numerous public presentations, conferences, workshops and exhibitions, many aimed at understanding and conserving the Afrotropical fauna.

The Council of LepSoc commissioned Graham Henning, its present council member responsible for conservation matters, to revise and update the first Red Data Book on South African butterflies compiled by S.F. Henning & G.A. Henning (1989), in particular applying the categories and criteria for threats provided by the International Union for the Conservation of Nature (IUCN) 2001. All members of LepSoc were invited to provide input, should they so wish. A number of provincial contributors, as well as two co-editors, were appointed to the task team. For a number of years, both co-editors as well as some other members have been involved in a number of research projects specifically related to butterfly conservation, some of them registered at various South African universities. This has resulted in the accumulation of nearly two decades of field-based experience and expertise since the publication of the first Red Data Book in 1989. This has now been incorporated in the current work which, it is hoped, would provide a document that more clearly identifies the threats faced by South African butterflies and give conservation managers and others a more robust framework on which decisions can be based.

Recently, LepSoc has paid much attention to partnerships, building on the unique and very rewarding association with the African Butterfly Research Institute (ABRI) in Nairobi, Kenya. New partnerships include collaboration with the Animal Demography Unit (ADU) of the University of Cape Town and the South African National Biodiversity Institute (SANBI). This tripartite association, the South African Butterfly Conservation Assessment (SABCA), is aimed at compiling a comprehensive butterfly atlas for South Africa, Lesotho and Swaziland. The atlas will also be used to refine the conservation assessment of South African butterflies. The Lepidopterists' Society of Africa much appreciates the publication of the present Red Data Book by SANBI.



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**Lepidopterists' Society of Africa**

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## Introduction

# Butterfly conservation in South Africa

Compiled by G.A. Henning, S.F. Henning, R.F. Terblanche & J.B. Ball

## Red Data Books, Red Lists and butterfly conservation in South Africa

**T**his publication fulfils the need for a revised South African Red Data Book for butterflies as well as for an improved proposed Red List of butterflies in South Africa. The first *South African Red Data Book—butterflies* (S.F. Henning & G.A. Henning 1989) was published as a report of the Committee for Nature Conservation National Programme for Ecosystem Research (South African National Scientific Programmes Report No. 158) and was issued by the Foundation for Research Development, Council for Scientific and Industrial Research. This Red Data Book was later supplemented by two short publications by the authors, which revised and updated some taxa (G.A. Henning & S.F. Henning 1992b, 1995).

Identifying those species most vulnerable to extinction is essential to the work of conservation (Primack 2002). In the past, a number of categories were established by the International Union for the Conservation of Nature (IUCN) and World Conservation Monitoring Centre (WCMC) to direct attention towards species of special conservation concern. These categories have proved problematic in some cases in terms of their meaning and subjectivity (Primack 2002). Despite the shortcomings of the categories that were initially established, they were applied with great success in S.F. Henning & G.A. Henning (1989). This publication milestone established a basis for the conservation of invertebrates, such as butterflies, in Africa. Members of the Lepidopterists' Society of Africa were most helpful in providing information on which the assessments of threatened species could be based. Also of great value was the vast amount of data available in collections throughout the country, made by enthusiastic lepidopterists over the past two centuries (Ball 1994a). Recently, the IUCN has developed categories and criteria that allow for more objective assessments of the probability of extinction, even where quantitative data are lacking. Red List assessments, based on the new categories and criteria, are reported in the present work and actions directed at saving numbers of highly localised South African butterfly species from significant threats, are proposed.

Human impacts pose a very real threat to butterfly biodiversity. Some species are more prone to extinction, owing to their inherent biological characteristics. The local butterfly species most at risk are usually the very localised myrmecophilous (ant-associated) lycaenid species (S.F. Henning 1983c, 1988b, 1997) or taxa with a narrow climatic tolerance. It should be noted that climate change does not necessarily affect the larval and adult stages of butterflies equally.

In South Africa, protected areas such as national parks and provincial nature reserves play an important part in preserving the butterfly species that fall within their boundaries by conserving their habitats. However, appropriate management of localised butterfly habitats, particularly for the ant-associated species, is usually also needed. This requires specialised knowledge and intensive studies. Most threatened species, however, occur on land that is either privately owned or controlled by the Department of Environmental Affairs and Tourism. The initial approach to butterfly conservation was to legislate against the collection of certain species, but this has proved ineffectual, largely because of difficulties in identifying threatened species. A lack of knowledge, coupled with the absence of appropriate management plans, has hindered effective habitat conservation for some species. It would appear that responsible scientific sampling for most South African butterflies and moths does no harm whatsoever to populations. Globally, there are no documented cases of extinctions, or even local extirpations,

of populations due to collecting. It should therefore be clearly stated that the main purpose of Red Lists and Red Data Books for butterfly species is not to provide lists of species to be protected from sampling by lepidopterists. Rather, such lists and books are intended to galvanise actions aimed at the preservation of habitats threatened by changes inimical to the survival of subpopulations of listed butterfly species.

The intention of this Red Data Book is to highlight the presence of threatened species, to provide a rationale for the listing of such taxa, and then to identify the actual threats facing these butterfly species. A review of the ecology of each species, if known, is given, enabling appropriate conservation action to be directed towards these threats. Research priorities that promote conservation management strategies for the species are also identified.

Red Data Books document the decline towards extinction, in both time and space, of taxa but, more importantly, also chart the journey needed to achieve the goal of species recovery.

## Threats to butterfly species in South Africa

Various compounding factors, as outlined by S.F. Henning & G.A. Henning (1989), Samways (1993, 1994), G.A. Henning (1997), New (1997) and Ball (2006), collectively constitute a threat to the existence of butterfly species. The most important consequence of these threats may be an increased risk of extinction. In South Africa, the collecting of Lepidoptera has not been shown to pose a threat to any species. Significantly, and paradoxically, it is the increased knowledge gained through collecting, coupled with appropriate action, that has often resulted in enhancing the conservation status of butterfly species. Those taxa for which ethical collecting should be considered, are highlighted in the text. A summary of the known threats to which South African butterfly species may be exposed, is given in Table 1. This list is not only useful for conservation managers, but also identifies numerous avenues for future research.

Population dynamics in butterflies in a stable habitat are largely determined by predator/prey ratios. The major predators of butterflies are parasitoids and predatory insects. Insect communities, including butterflies, may have a population turnover in a matter of weeks. Natural parasitoids and predators of insects, including those of butterflies, create a dynamic balance within ecologically healthy communities. There are many insectivorous life forms, including insects themselves, mammals, birds, reptiles, fish, spiders and even some plants. Many infectious diseases, although poorly studied in natural ecosystems, are also a regulatory factor in this dynamic balance. The early developmental stages of insects are, in particular, at the base of many terrestrial food webs. One female butterfly may lay more than 500 eggs, only two of which are required to reach adulthood for the population to remain constant; the remainder may be consumed at various metamorphic stages. Butterfly populations have strong recuperative powers, providing that the integrity of their habitat is maintained. Much research is still needed to quantify and qualify our understanding of the biological interactions mentioned above, especially in Africa.

Numerous studies worldwide have established that the major or only cause of loss or decline of terrestrial insect populations is habitat alteration or destruction (Pyle *et al.* 1981; New 1997). Therefore, the primary importance of habitat conservation as the key to butterfly conservation is recognised across the world (S.F. Henning 1987c; Larsen 1995; Kudrna 1995; Munguira 1995; New 1995; Oates 1995; Opler 1995; Pullin *et al.* 1995; Thomas 1995; Warren 1995; G.A. Henning 2001b; Ball 2006).

At present, the most significant causes of butterfly habitat loss or modification in South Africa are: invasive alien vegetation, changing fire regimes (either an increased or reduced frequency), agricultural activities, urbanisation, plantation forestry, increased grazing and road construction (Ball 2006). Urbanisation has recently been at the centre of a few high-profile butterfly conservation situations. Such cases include the Roodepoort Copper *Aloeides dentatis dentatis*, the Brenton Blue butterfly *Orachrysops niobe* and the Heidelberg Copper butterfly *Chrysothrix aureus* (S.F. Henning & G.A. Henning 1989; G.A. Henning & S.F. Henning 1992a; S.F. Henning *et al.* 1993a; G.A. Henning & Roos 1998; Roos & G.A. Henning 2000; Armstrong 2002; Edge 2002; Edge *et al.* 2008a; Terblanche *et al.* 2003).

Table 1.— A checklist of factors that may cause habitat loss, habitat change or more direct loss of individuals of butterfly populations under African conditions. Factors that affect the functioning of metapopulations are also included. Note that the impacts can similarly apply to organisms essential for symbiosis, such as the host ant of myrmecophilous butterfly species.

Factor	More detailed categorisation	Possible major impacts on butterflies
Urbanisation (urban sprawl, expansion)	Residential developments	Loss of habitat, loss of dispersal corridors
	Recreational developments (golf courses, resorts)	
	Transport networks and traffic	
	Industrial structures and mining areas	
Introduced invasive organisms (biotic pollution)	Invasion by introduced plants (including cultivated crops)	Loss of habitat, loss of dispersal corridors, loss of host plant(s) due to competition, loss of nectar sources due to competition. Loss of suitable niches.
	Invasion by introduced animals	Loss of habitat (due to habitat-modifying impacts), loss of dispersal corridors, loss of host plants due to herbivory, loss of individuals due to competition, loss of individuals due to predation
Agricultural activities: croplands	Crops	Loss of habitat, loss of dispersal corridors
	Plantations	
Rangeland and reserve management practices	Overgrazing or undergrazing	Change in habitat and loss of niches
	Frequency of fires too high or too low	
	Intensity of fires too high or too low	
	Trampling effects of too many tourists at habitat	
Global climatic changes accompanied by global warming	Increase in seasonal temperatures is too fast for species to adapt. Habitats may change owing to global warming.	Change in habitat and loss of niches
Application of pesticides	Broad-spectrum pesticides	Habitat modification due to soil modification, secondary (new) competition due to lack of natural enemies
	Lepidoptera- or more target-specific insecticides	Direct loss of individuals
Pollution by industries	Chemical water pollution	Change in wetland habitat and loss of niches
	Chemical soil pollution	Change in habitat and loss of niches
	Air pollution and acid rain	Change in habitat, effects on larval host plants and loss of niches
	Sewage and effluents	Change in wetland habitat and loss of niches
Exploitation by humans	Over-collecting for collections	None, quantity insignificant
	Over-collecting for commercial purposes	Direct loss of individuals, quantity may become significant

Effectively, habitat changes that are significant enough to critically alter the niche requirements of a butterfly species, constitute a loss of habitat. Habitat changes result in an absence of conditions, resources and biological interactions that are required by individuals of a species for their survival. Some abiotic conditions that influence the survival of butterflies are temperature, pH (a measure of acidity or alkalinity, in this case in soil and rain), salinity, relative humidity and the concentration of pollutants. These conditions may themselves be modified

by other organisms, for example the height and density of local vegetation (Begon *et al.* 2006). Resources include the availability of larval host plants or nectar and other food sources of adult butterflies (Kroon 1999). An example of an essential biological interaction is the presence of an associated ant for the protection of ant-associated (myrmecophilous) butterfly species. Habitat loss may also lead to smaller populations and eventually to a loss of genetic integrity, owing to processes such as genetic drift. The loss of corridors for dispersal may lead to a decline in founder populations as well as the genetic integrity of subpopulations within a metapopulation. Therefore, the crux of butterfly conservation is the quality of the habitat and the ability to maintain gene flow.

Not only is mankind directly involved in habitat destruction but also indirectly by introducing alien fauna and flora. Alien vegetation has invaded and even 'destroyed' large tracts of natural vegetation, a process that is extremely difficult to reverse and very expensive to control on a large scale. Alien invasive vegetation is usually unsuitable as food for indigenous fauna, particularly the larvae of butterflies and moths. Indigenous insect diversity is altered but not necessarily depleted under alien vegetation. Both abundances and invertebrate species composition change as a consequence of alien vegetation (Samways *et al.* 1996). The establishment of invader plants in existing plant communities disturbs the delicate ecological balances that operate between competitive plant communities. This usually results in the dominance of the invader species over the indigenous plant communities. The success of invader plants can be seen all around us and is to a great extent due to the absence of natural enemies of these species. In South Africa, the introduction of alien plants, especially from Australia and South America, has had a serious effect on butterfly populations over the past 40 to 50 years. When an ecosystem has changed, either as a result of habitat destruction or invasive alien vegetation, it is usually no longer suitable for the bulk of the fauna associated with the original plant communities.

In South Africa, the butterflies most at risk are the myrmecophilous (ant-associated) Lycaenidae, also known as Blues, Coppers, Opals and Thestors. These species are often extremely local as they require the presence of the larval food plant and the host ant as well as optimal abiotic and habitat conditions. A mosaic of microhabitats, often in different successional stages, complicates the issue. Thus, being confined to a limited area, these species are particularly vulnerable to disturbances of their preferred habitat. The building of a house, the construction of a road or the ploughing of a field could lead to the extinction of a rare species confined to a single locality.

An overlooked but harmful alien invader, which is active in the habitats of many butterflies, is the introduced Argentine Ant, *Linepithema humile* (= *Iridomyrmex humile*). This is regarded as one of the most pernicious ants in the world. It is popular wisdom that it was introduced in imported horse fodder during the Anglo-Boer Wars (1880–1881, 1899–1902). However, there is some evidence that it has been present in the Western Cape Province since about 1750 (Slingsby & Robertson 1991). It has since spread far inland. The ant appears to have been first recorded in Johannesburg in the 1970s. However, little is known about the actual distribution of this destructive little creature in South Africa. Apart from doing harm in many other ways, it drives away indigenous ants by harassing them, killing them and taking over their nests and food supplies. Sugar ants, such as the Spotted Sugar Ant (*Camponotus maculatus*), the Black Marsh Ant (*Camponotus niveosetosus*) and the small Black Sugar Ant (*Lepisiota capensis*), can be attacked by this alien invader. These indigenous ants play an important role in the life cycles of various lycaenid butterflies and hence they are integral components of the ecosystems in which the associated butterflies occur. By killing and replacing indigenous ants, the Argentine Ant adversely affects the butterfly fauna as well as other insects and the organisms (including plants) dependent upon them.

Many indigenous ants, including the species that act as hosts to lycaenid butterfly larvae, are agents in the dispersal of elaiosome-bearing seeds. These seeds have fleshy, oily structures attached to them that contain powerful ant attractants. The indigenous ants laboriously collect these seeds and take them to their underground nests, in the safety of which they remove and consume the elaiosomes. The seeds, without the elaiosomes but still viable, are either left lying in the ants' nests or they are carried to the surface and dumped outside the nests on the ants' refuse middens. In both situations the seeds are more likely to germinate. The seeds are thus dispersed widely and those left in the ants' nests are protected against fire, seed-eating birds, rats and mice. When the seeds are not dispersed by ants, the plants depending on this mode of seed dispersal become rarer and eventually disappear completely.

The Argentine Ant plays no part in seed dispersal because, although they eat elaiosomes, they do not collect and transport seeds. Instead, they leave them lying under the parent plants, where they are easily found and eaten by birds and small mammals. In this way the Fynbos Biome of

South Africa is being deleteriously modified by the Argentine Ant (Bond & Slingsby 1984). The Argentine Ant can even replace indigenous ant species (Donnelly & Giliomee 1985) and it may also reduce invertebrate diversity (Human & Gordon 1997). The disappearance from a localised area of certain plants adversely affects the associated guilds of insects, including butterflies, whose larvae feed on these plants. The Argentine Ant thus not only causes the disappearance of ants associated with butterflies but also, most probably, of those larval host plants whose seeds are dependent upon dispersal by ants.

Fire, though it may be destructive, is a natural and essential component of a number of our biomes, particularly Fynbos, Grassland and Savanna. The seasonality and frequency of fires is an important component in determining floristic species composition and community type. Fynbos is a fire climax vegetation type. As an example, over 2 000 of the nearly 2 200 plant species of the Cape Peninsula are found in fire-prone fynbos. The natural frequency of fire (5–50 years in fynbos and 2–10 years in renosterveld) in the Fynbos Biome varies considerably for its three major vegetation complexes and associated vegetation types (Rebello *et al.* 2006). No research on the fire requirements of South African butterfly species has been published. Studies of prairie-associated habitat-specialist butterflies in the USA have shown that infrequent fires were usually more beneficial than rotational burning, which often results in very low numbers of these insects (Swengel 1998). Too frequent fires appear to have been the cause of probable extinction of the Scarce Mountain Copper (*Trimenia malagrida malagrida*) on Lion's Head in Cape Town (Ball 2006). Conversely, too infrequent fires appear to have contributed to the extirpation of Eriksson's Copper (*Erikssonia acraeina*) in Limpopo Province (Dobson & Garvie 2005). The synergistic effect of alien invasive vegetation and increased fire frequency appears to accelerate habitat degradation.

Recent research on vegetation composition in the habitats of the Heidelberg Copper butterfly (*Chrysoritis aureus*) suggests that the occurrence of fires is essential to maintain the correct habitat for the survival of this species (Terblanche *et al.* 2003, Terblanche 2005). The optimal frequency and intensity of such fires has to be assessed by more research effort. If fires occur too frequently or infrequently, or at the wrong time of the year, they may harm the local flora and fauna. Butterflies are particularly vulnerable to fires during their breeding season and especially if they are univoltine (only one generation maturing each year) as it affects the reproductive adults as well as their eggs, larvae and pupae on the food plants. Ant-associated butterfly larvae and pupae, which at the time of the fire are normally in underground ants' nests, are fire-adapted and are not adversely affected if a fire occurs at this time. It is quite common to see newly emerged adult ant-associated lycaenid butterflies flying about their burnt habitat and settling on dead twigs and blackened soil. In fact, there is anecdotal evidence that some species seem to prefer to emerge only after their habitats have been burnt.

## Conservation measures

When a species has been reduced to one or a very few populations, it may need habitat management to protect it from an array of threats. It is often the butterfly collectors who initially become aware of the rarity and endangerment of a species. Appropriate authorities are then advised of the situation. The South African Natural Heritage Programme, introduced by the Department of Environmental Affairs in 1985, aims to establish natural areas, known as Natural Heritage Sites, in private or public ownership, thus encouraging landowners to actively participate in biodiversity conservation. A breeding locality of the rare Heidelberg Copper (*Chrysoritis aureus*) at Heidelberg in Gauteng is one of these registered heritage sites. The phytophagous (plant-eating) larvae of this species are associated with *Crematogaster* (Cocktail) ants.

South Africa, Lesotho and Swaziland are richly endowed with butterflies, many of them endemic to this southern region of Africa. The combined surface area of the region is 1 266 182 km<sup>2</sup> (Low & Rebello 1998). There are nine Biome Units in this region (Mucina & Rutherford 2006). The butterfly fauna consists of five families, 17 subfamilies, 153 genera, 664 species and 137 additional subspecies, an ultimate total of 801 specific and subspecific taxa. Some 51.6% of these taxa are endemic and 63 taxa have been included in this Red Data Book (= 7.87% of the total number of taxa). In S.F. Henning & G.A. Henning (1989), 141 species and subspecies were listed as having some degree of threat. South Africa has one of the highest proportions of lycaenid butterflies (49.6%) for any region in the world. Of the threatened taxa, about 80% are lycaenids, most of which are ant-associated (G.A. Henning 1991; New 1993; S.F. Henning & G.A. Henning 1996a; G.A. Henning 1997; Ball 2006). There are about 4 000 butterfly species in the Afrotropical

Region (Williams 2007) of which 16.8% are found in South Africa, Lesotho and Swaziland (Woodhall 2005).

The Biome Unit containing the greatest number of threatened butterfly species is Grassland (Ball 2006). Here many habitats are under threat from agriculture, plantation forestry and other development. It is the least conserved of the Biome Units (Low & Rebelo 1998).

Four threatened butterfly species have had reserves proclaimed in order to try and prevent their extinction. They are the Brenton Blue (*Orachrysops niobe*), the Coega Copper (*Aloeides clarki*), the Roodepoort Copper (*Aloeides dentatis*) and the Heidelberg Copper (*Chrysoritis aureus*). According to Morris *et al.* (1994), present efforts at conserving butterfly species are based on a number of principles. Firstly, the ecology of each species should be thoroughly understood, with emphasis on oviposition and the immature stages. The larval stage, in particular, is often of greater ecological significance than the adult stage. Secondly, there must be the ability to manipulate the habitat by management (Morris & Thomas 1989; Oates & Warren 1990). Short-term evidence from research in Great Britain shows that populations of both common and scarce butterfly species can be conserved in small, isolated areas (Munguira & Thomas 1992). Initial research in South Africa has indicated the viability of small reserves in protecting threatened butterflies (Deuschländer & Bredenkamp 1999). However, small populations of checkerspot butterflies (*Melitaea cinxia*) in North America, with reduced genetic diversity, have been shown to have deleterious levels of inbreeding. This has been noted to increase the risk of local population extinction (Saccheri *et al.* 2004).

Most insects, including butterflies, have a larger suite of ecological requirements than merely their food plants. However, the latter must grow in the microhabitat preferred by the butterfly and in sufficient quantities to sustain viable butterfly populations (Morris *et al.* 1994). The appropriate management of grassland in reserves or protected areas for conservation consists of a series of subtle and finely tuned processes (Morris 1991). It is advantageous to extend existing optimal butterfly habitat as well as (if possible) create new habitats for butterflies. The conservation of butterflies preferably requires multispecies recovery plans, as through a broader and more integrative approach they are more likely to be successful than single-species plans (Boersma *et al.* 2001). Connecting (dispersal) corridors, in an African context, between colonies of a butterfly species are important (Pryke & Samways 2003). Established butterfly colonies can serve as sources for dispersal to other suitable breeding areas (Warren 1987). Thomas (1993) suggested that the early-successional habitats of many European butterfly species are 'unnatural' and a direct consequence of the combination of post-glacial changes in climate and land use during the Holocene.

It is clear that detailed analysis of the ecological requirements of a threatened species has to be undertaken before effective conservation measures and management can be initiated. Furthermore, co-operation between all interested parties should be both encouraged and nurtured to assist with the long-term conservation of our biodiversity (G.A. Henning 2001a). It is sobering to note that some well-intentioned conservation plans could be annulled by the synergistic effects of habitat modification and global climate warming (Warren *et al.* 2001).

## Application of the IUCN (2001) Red List categories and criteria to South African butterflies

All the currently described butterfly species and subspecies in South Africa have been evaluated during the compilation of this Red Data Book and the proposed updated Red List. The IUCN Red List Categories and Criteria Version 3.1 (IUCN 2001), given in Appendix 1, have been applied. A rationale for each taxon has been provided. Owing to a lack of research and quantitative data on the population dynamics of most South African butterfly species, declines in the abundance of species are often measured on the basis of a decline in the number of subpopulations (lost localities) or are based on the anecdotal observations of lepidopterists. Furthermore, the extent of occurrence (EOO; B1) of localised butterfly species, with patchy distributions, may be misleading and the area of occupancy (AOO; B2) is often preferred as a more meaningful indicator of possible threats. Despite gaps in the knowledge of butterfly distributions and metapopulation dynamics, it is believed that the most recent and more objective IUCN categories have facilitated an improved Red List as presented here. The

bulk of the data utilised in this publication have been gathered over many years by numerous enthusiasts, mainly amateur, as well as a few professional entomologists. The South African Butterfly Conservation Assessment (SABCA), a four-year programme starting in May 2007, aims to document and conserve South Africa's rich lepidopteran biodiversity. This will be a collaborative effort between the Lepidopterists' Society of Africa, the University of Cape Town's Animal Demography Unit (ADU) and the South African National Biodiversity Institute (SANBI). The butterfly atlas, that will be a product of SABCA, will offer the opportunity of further refining the Red List.

The Red List provided here has been produced by a global assessment. Migrant and marginal species are not included under any of the threatened categories; most of these taxa have a wide distribution in the Afrotropical Region. None of the species classified as Indeterminate in the previous Red Data Book (S.F. Henning & G.A. Henning 1989) are included here. The following current classifications are also excluded from the species reviews in this Red Data Book: Near Threatened (NT), Least Concern (LC), Data Deficient (DD) and Not Evaluated (NE). Only the extinct and threatened categories are included. An outline of all the evaluated South African butterfly species follows the review of the threatened taxa.

A few butterfly species in South Africa are conserved in small nature reserves or in insect-specific reserves under management. These biotopes are still considered under threat as the full effects of the long-term management plans in a time of rapid climate change have to be evaluated. A number of very localised butterfly species are also present in some of the provincial reserves and national parks in South Africa. In the absence of specific management plans, they cannot necessarily be considered as 'safe' and they therefore often remain in one of the threatened categories. Note, for example, that the well-intentioned overprotection from fire almost led to the extinction of the Heidelberg Copper butterfly at its type locality (Terblanche 2005).

Subspecies are regarded as Evolutionary Significant Units (ESUs) and are therefore included here since it is important that they are also conserved. Taxonomic changes between the species and infraspecific levels still occur, owing to present taxonomic uncertainties. Since nominal extinctions could lead to neglect of the conservation of ESUs, subspecies are included as a precaution (Terblanche & Van Hamburg 2003; Edge 2005; Ball 2006).

The term 'taxon' (pl. 'taxa') is used to denote a taxonomic unit, in this study either a species or a subspecies.

An outline of the present IUCN categories and their significance follows. For more detail on the IUCN criteria, Version 3.1 (IUCN 2001), for the threatened categories Critically Endangered, Endangered and Vulnerable, the reader is referred to Appendix 1.

## EXTINCT CATEGORIES

### **Extinct (EX)**

A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the life cycle and life form of the taxon.

### **Extinct in the Wild (EW)**

A taxon is Extinct in the Wild when it is known to survive only in cultivation, in captivity or as a naturalised population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the life cycle and life form of the taxon.

## THREATENED CATEGORIES

### **Critically Endangered (CR)**

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the Criteria A to E for Critically Endangered, and it is therefore considered to be facing an extremely high risk of extinction in the wild.

**Endangered (EN)**

A taxon is Endangered when the best available evidence indicates that it meets any of the Criteria A to E for Endangered, and it is therefore considered to be facing a very high risk of extinction in the wild.

**Vulnerable (VU)**

A taxon is Vulnerable when the best available evidence indicates that it meets any of the Criteria A to E for Vulnerable, and it is therefore considered to be facing a high risk of extinction in the wild.

**CATEGORIES NOT CONSTITUTING A THREATENED STATUS****Near Threatened (NT)**

A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

**Least Concern (LC)**

A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.

**Data Deficient (DD)**

A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking.

Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available.

In many cases great care should be exercised in choosing between DD and a threatened status. If the range of a taxon is suspected to be relatively circumscribed, and a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

**Not Evaluated (NE)**

A taxon is Not Evaluated when it has not yet been evaluated against the criteria.



# Red List of South African butterflies

## Superfamily Papilionoidea

### Family Nymphalidae

#### Subfamily Heliconiinae

*Telchinia induna salmontana* [VU B2ab(iii)]

#### Subfamily Satyrinae

*Dingana clara* [VU D2]

*Dingana dingana* [VU B2ab(iii)]

*Dingana fraterna* [EN B1ac(iv)+2ac(iv); C2a(ii)]

*Dingana jerinae* [VU D2]

*Pseudonympha paragaika* [VU D2]

*Pseudonympha swanepoeli* [CR B2ab(i,ii,iii,iv,v)]

*Stygionympha dicksoni* [CR B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)]

### Family Lycaenidae

#### Subfamily Poritiinae

*Alaena margaritacea* [CR A3ce; B2ab(i,ii,iii,iv,v)]

*Deloneura immaculata* [EX]

*Durbania amakosa albescens* [VU A3c; B2ab(i,ii,iii,iv)]

*Durbania amakosa flavida* [EN A3c; B2ab(i,ii,iii,iv)]

*Durbania amakosa sagittata* [VU B2ab(iii); D2]

*Durbaniella clarki belladonna* [VU D2]

#### Subfamily Theclinae

*Aloeides barbarae* [EN A3ce; B1ab(ii,iii)+2ab(ii,iii)]

*Aloeides carolynnae aurata* [VU D2]

*Aloeides carolynnae carolynnae* [EN A3ce; B2ab(i,ii,iii,iv,v)]

*Aloeides clarki* [EN A3ce; B2ab(i,ii,iii,iv,v)]

*Aloeides dentatis dentatis* [VU B2ab(ii,iii); D2]

*Aloeides lutescens* [VU B1ab(ii)+2ab(ii)]

*Aloeides nubilus* [EN A3ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)]

*Aloeides rossouwi* [EN A3ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)]

*Aloeides stevensoni* [VU D2]

*Aloeides thyra orientis* [EN B2ab(i,ii,iii,iv,v); C2a(i)]

*Aloeides trimeni southeyae* [VU A3ce; B1ab(iii) + 2ab(iii)]

*Capys penningtoni* [VU B1ab(ii)+2ab(ii)]

*Chrysoritis aureus* [VU B1ab(ii,iv)+2ab(ii,iv); D2]

*Chrysoritis dicksoni* [CR A3ce; B2ab(i,ii,iii,iv,v)]

*Chrysoritis lyncurium* [VU B2ab(iii,iv); D2]

*Chrysoritis penningtoni* [VU A2c; B2ab(iii); C1]

*Chrysoritis rileyi* [EN B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)]

*Chrysoritis thysbe mithras* [EN B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)]

*Chrysoritis thysbe schloszae* [CR C2a(i)]

*Chrysoritis thysbe whitei* [EN A3ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)]

- Chrysoritis trimeni* [VU A3c; D2]  
*Eriksonia acraeina* [CR A1ac+2a; B1ab(iii,v)c(iv)+2ab(iii,v)c(iv)]  
*Trimenia malagrida malagrida* [CR A4ce; 2ab(i,ii,iii,iv,v); D]  
*Trimenia malagrida paarlensis* [EN B2ab(i,ii,iii,iv,v)]  
*Trimenia wallengrenii gonnemoui* [VU B2ab(iii); D2]  
*Trimenia wallengrenii wallengrenii* [CR A3ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)]

#### Subfamily Polyommatainae

- Anthene juanita* [VU B1ab(iv)c(iv)+2ab(iv)c(iv); D1+2]  
*Anthene lindae* [VU D2]  
*Lepidochrysops hypopolia* [EX]  
*Lepidochrysops irvingi* [VU A3ce; B2ab(i,ii,iii,iv,v)]  
*Lepidochrysops jefferyi* [EN A3ce; B1ab(ii,iii)+2ab(ii,iii)]  
*Lepidochrysops ketsi leucomacula* [VU A3ce; B2ab(iii); D2]  
*Lepidochrysops lotana* [CR B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)]  
*Lepidochrysops methymna dicksoni* [EX]  
*Lepidochrysops pephredo* [VU B2ab(iii)]  
*Lepidochrysops praeterita* [EN A2c; B1ab(iv)+2ab(iv)]  
*Lepidochrysops rossouwi* [VU A3ce; B2ab(iii)]  
*Lepidochrysops swanepoeli* [VU A3ce; B1ab(ii,iii)+2ab(ii,iii)]  
*Orachrysops ariadne* [EN B1ab(iii)+2ab(iii)]  
*Orachrysops mijburghi* [VU D2]  
*Orachrysops montanus* [VU D2]  
*Orachrysops niobe* [CR B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v); C2a(ii)]

#### Subfamily Miletinae

- Thestor brachycerus brachycerus* [CR B2ab(i,ii,iii)]  
*Thestor dicksoni malagas* [VU D2]  
*Thestor protumnus terblanchei* [VU C2b; D1+2]

## Superfamily Hesperioidea

### Family Hesperidae

#### Subfamily Heteropterinae

- Metisella meninx* [VU A3ce]

#### Subfamily Hesperinae

- Kedestes barberae bunta* [CR A2ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v); D]  
*Kedestes lenis lenis* [EN A2ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v); D]  
*Platylesches dolomitica* [VU D2]



# Red List taxa according to the IUCN (2001) categorisation

The biome units indicated are those described by Mucina & Rutherford (2006).

Taxon	Biome Unit
<b>Extinct:</b> (3/63 = 4.8% of South African Red-Listed taxa)	
<i>Deloneura immaculata</i> .....	Forest/Savanna ecotone
<i>Lepidochrysops hypopolia</i> .....	Grassland
<i>Lepidochrysops methymna dicksoni</i> .....	Fynbos
<b>Critically Endangered:</b> (12/63 = 19.0% of South African Red-Listed taxa)	
<i>Alaena margaritacea</i> .....	Grassland
<i>Chrysoritis dicksoni</i> .....	Fynbos
<i>Chrysoritis thysbe schloszae</i> .....	Fynbos
<i>Erikssonia acraeina</i> .....	Savanna
<i>Kedestes barberae bunta</i> .....	Fynbos
<i>Lepidochrysops lotana</i> .....	Grassland
<i>Orachrysops niobe</i> .....	Fynbos
<i>Pseudonympha swanepoeli</i> .....	Grassland
<i>Stygionympha dicksoni</i> .....	Fynbos
<i>Thestor brachycerus brachycerus</i> .....	Fynbos
<i>Trimenia malagrida malagrida</i> .....	Fynbos
<i>Trimenia wallengrenii wallengrenii</i> .....	Fynbos
<b>Endangered:</b> (16/63 = 25.3% of South African Red-Listed taxa)	
<i>Aloeides barbara</i> .....	Grassland
<i>Aloeides carolynnae carolynnae</i> .....	Fynbos
<i>Aloeides clarki</i> .....	Albany Thicket
<i>Aloeides nubilus</i> .....	Grassland
<i>Aloeides rossouwi</i> .....	Grassland
<i>Aloeides thyra orientis</i> .....	Fynbos
<i>Chrysoritis rileyi</i> .....	Fynbos
<i>Chrysoritis thysbe mithras</i> .....	Fynbos
<i>Chrysoritis thysbe whitei</i> .....	Albany Thicket
<i>Dingana fraterna</i> .....	Grassland
<i>Durbania amakosa flavida</i> .....	Savanna
<i>Kedestes lenis lenis</i> .....	Fynbos
<i>Lepidochrysops jefferyi</i> .....	Grassland
<i>Lepidochrysops praeterita</i> .....	Grassland
<i>Orachrysops ariadne</i> .....	Grassland
<i>Trimenia malagrida paarlensis</i> .....	Fynbos

Taxon	Biome Unit
<b>Vulnerable: (32/63 = 50.8% of South African Red-Listed taxa)</b>	
<i>Aloeides carolynnae aurata</i> .....	Fynbos
<i>Aloeides dentatis dentatis</i> .....	Grassland
<i>Aloeides lutescens</i> .....	Fynbos
<i>Aloeides stevensoni</i> .....	Grassland
<i>Aloeides trimeni southeyae</i> .....	Fynbos
<i>Anthene juanitae</i> .....	Forest
<i>Anthene lindae</i> .....	Savanna
<i>Capys penningtoni</i> .....	Grassland
<i>Chrysoritis aureus</i> .....	Savanna
<i>Chrysoritis lyncurium</i> .....	Grassland
<i>Chrysoritis penningtoni</i> .....	Grassland
<i>Chrysoritis trimeni</i> .....	Succulent Karoo
<i>Dingana clara</i> .....	Grassland
<i>Dingana dingana</i> .....	Grassland
<i>Dingana jerinae</i> .....	Grassland
<i>Durbania amakosa albescens</i> .....	Indian Ocean Coastal Belt
<i>Durbania amakosa sagittata</i> .....	Grassland
<i>Durbaniella clarki belladonna</i> .....	Albany Thicket>Nama-Karoo
<i>Telchinia induna salmontana</i> .....	Grassland
<i>Lepidochrysops irvingi</i> .....	Grassland
<i>Lepidochrysops ketsi leucomacula</i> .....	Indian Ocean Coastal Belt
<i>Lepidochrysops pephredo</i> .....	Grassland
<i>Lepidochrysops rossouwi</i> .....	Grassland
<i>Lepidochrysops swanepoeli</i> .....	Grassland
<i>Metisella meninx</i> .....	Grassland
<i>Orachrysops mijburghi</i> .....	Grassland
<i>Orachrysops montanus</i> .....	Grassland
<i>Platylesches dolomitica</i> .....	Savanna
<i>Pseudonympha paragaika</i> .....	Grassland
<i>Thestor dicksoni malagas</i> .....	Fynbos
<i>Thestor protumnus terblanchei</i> .....	Grassland
<i>Trimenia wallengrenii gonnemoui</i> .....	Fynbos



# Statistics on proposed Red List taxa according to biome unit (BU)

Biome units are according to the classification of Mucina & Rutherford (2006).

Notes:

- (i) Some taxa occur in ecotones between different vegetation types and even biomes.
- (ii) Biomes of the three extinct taxa are excluded. They were: one Fynbos Biome Unit, one Grassland Biome Unit and one possibly the ecotone between Forest and Savanna Biome Units. A total of 60 taxa are proposed in the threatened categories.

Grassland BU 28/60	=	46.7%
Fynbos BU 19/60	=	31.7%
Savanna BU 6/60	=	10.0%
Albany Thicket BU 3/60	=	5.0%
Indian Ocean Coastal Belt BU 2/60	=	3.3%
Succulent Karoo BU 1/60	=	1.7%
Nama-Karoo BU 1/60	=	1.7%
Forest BU 1/60	=	1.7%

Note:

78.4% (47/60) of the proposed 'at risk' taxa occur in only two Biome Units: Grassland (331 233 km<sup>2</sup>) and Fynbos (76 744 km<sup>2</sup>) (Low & Rebelo 1998).

**Vegetation Units (*sensu* Mucina & Rutherford 2006) in the nine Biome Units that contain more than one threatened butterfly taxon—hot spots**

**Vegetation Units with four 'at risk' butterfly taxa**

- Barberton Montane Grassland (Grassland Biome)
- Knysna Sand Fynbos (Fynbos Biome)
- Swartland Shale Renosterveld (Fynbos Biome)

**Vegetation Unit with three 'at risk' butterfly taxa**

- Woodbush Granite Grassland (Grassland Biome)

**Vegetation Units with two 'at risk' butterfly taxa**

- Breede Sand Fynbos (Fynbos Biome)
- Cape Flats Dune Strandveld (Fynbos Biome)
- Eastern Free State Sandy Grassland (Grassland Biome)
- Lydenburg Montane Grassland (Grassland Biome)
- Mooi River Highland Grassland (Grassland Biome)
- Pondoland-Ugu Sandstone Coastal Sourveld (Indian Ocean Coastal Belt Biome)
- Rand Highveld Grassland (Grassland Biome)
- Southern KwaZulu-Natal Moist Grassland (Grassland Biome)



# Red-Listed species per province of South Africa

Note: Regional assessments have not been applied for this Red Data Book. These Red-Listed species of the provinces are according to the *global* assessments applied throughout this Red Data Book.

## Threatened butterflies of the Eastern Cape Province (EC)

Compiled by E.L. Pringle, J.B. Ball & R.F. Terblanche

Surface area of the EC: 169 580 km<sup>2</sup> (GCIS 2004), which is 13.9% of the total area of SA and 13.4% of the total area of SA, L and SW. Biome Units involved: 8 (Fynbos, Succulent Karoo, Nama-Karoo, Grassland, Savanna, Albany Thicket, Indian Ocean Coastal Belt and Forest) (Mucina & Rutherford 2006). Recorded butterfly fauna falls into: 5 families, 17 subfamilies, 123 genera, 347 species and 17 subspecies (364 taxa). Shared endemic genera: 17. Exclusive endemism: 23 species and 11 subspecies (34 taxa). Shared endemism: 100 species and 18 subspecies (118 taxa). Proposed Red List taxa: 7 of which 6 are exclusively endemic to the EC (of which 1 is categorised as Extinct) and 1 has shared endemism with KZN.

### Red List of the Eastern Cape Province

#### Lycaenidae

*Aloeides clarki*  
*Chrysoritis lyncurium*  
*Chrysoritis penningtoni*  
*Chrysoritis thysbe whitei*  
*Deloneura immaculata*  
*Durbaniella clarki belladonna*  
*Lepidochrysops ketsi leucomacula*

## Threatened butterflies of the Free State Province (FS)

Compiled by R.F. Terblanche, J.B. Ball & G.A. Henning

Surface area of the FS: 129 480 km<sup>2</sup> (GCIS 2004), which corresponds to 10.6% of the total area of SA and 10.2% of the total area of SA, L and SW. Biome Units involved: 3 (Savanna, Nama-Karoo and Grassland) (Mucina & Rutherford 2006). Recorded butterfly fauna falls into: 5 families, 16 subfamilies, 73 genera, 168 species and 5 additional subspecies (173 taxa). Shared endemic genera: 7. Exclusive endemism: 4 species and 2 subspecies (6 taxa). Shared endemism: 33 species and 7 subspecies (40 taxa). Proposed Red List taxa: 7.

### Red List of the Free State Province

#### Nymphalidae

*Pseudonympha paragaika*

#### Lycaenidae

*Durbania amakosa sagittata*  
*Lepidochrysops praeterita*  
*Orachrysops mijburghi*  
*Orachrysops montanus*  
*Thestor protumnus terblanchei*

#### Hesperiidae

*Metisella meninx*

### Free State butterfly hot spots

#### Golden Gate Highlands National Park

*Pseudonympha paragaika*  
*Orachrysops montanus*

## Threatened butterflies of Gauteng Province (G)

Compiled by G.A. Henning, P.S. Roos, J.B. Ball & R.F. Terblanche

Surface area of G: 17 010 km<sup>2</sup> (GCIS 2004), which corresponds to 1.4% of the total area of SA and 1.3% of the total area of SA, L and SW. Biome Units involved: 2 (Savanna and Grassland) (Mucina & Rutherford 2006). Recorded butterfly fauna falls into: 5 families, 16 subfamilies, 90 genera, 211 species and 1 additional subspecies (212 taxa). Shared endemic genera: 8. Exclusively endemic species: 1 (1 taxon). Exclusively endemic subspecies: none. Shared endemism: 19 species and 2 subspecies (21 taxa). Proposed Red List taxa: 6.

### Red List of Gauteng Province

#### Lycaenidae

*Aloeides dentatis dentatis*  
*Chrysoritis aureus*  
*Lepidochrysops praeterita*  
*Orachrysops mijburghi*

#### Hesperiidae

*Metisella meninx*  
*Platylesches dolomitica*

### Gauteng butterfly hot spots Suikerbosrand Nature Reserve

*Aloeides dentatis dentatis*  
*Chrysoritis aureus*  
*Orachrysops mijburghi*  
*Metisella meninx*

### South of Carletonville and Hillshaven

*Lepidochrysops praeterita*  
*Platylesches dolomitica*

## Threatened butterflies of KwaZulu-Natal Province (KZN)

Compiled by A. Armstrong, J.B. Ball & R.F. Terblanche

Surface area of KZN: 92 100 km<sup>2</sup> (GCIS 2004), which corresponds to 7.6% of the total area of SA and 7.3% of the total area of SA, L and SW. Biome Units involved: 4 (Grassland, Savanna, Indian Ocean Coastal Belt and Forest) (Mucina & Rutherford 2006). Recorded butterfly fauna falls into: 5 families, 17 subfamilies, 138 genera, 407 species and 13 additional subspecies (420 taxa). Shared endemic genera: 12. Exclusive endemism: 9 species and 10 subspecies (19 taxa). Shared endemism: 69 species and 12 subspecies (71 taxa). Proposed Red List taxa: 10 (7 of them exclusively endemic and 1 extinct).

### Red List of KwaZulu-Natal Province

#### Nymphalidae

*Dingana dingana*

#### Lycaenidae

*Capys penningtoni*  
*Chrysoritis lyncurium*  
*Durbania amakosa albescens*  
*Durbania amakosa flavida*  
*Lepidochrysops hypopolia*  
*Lepidochrysops ketsi leucomacula*  
*Lepidochrysops pephredo*  
*Orachrysops ariadne*

#### Hesperiidae

*Metisella meninx*

### KwaZulu-Natal butterfly hot spots Margate area

*Durbania amakosa albescens*  
*Lepidochrysops ketsi leucomacula*

## Threatened butterflies of Limpopo Province (LP)

Compiled by G.A. Henning, S.F. Henning, E.L. Pringle, J.B. Ball & R.F. Terblanche

Surface area of LP: 123 910 km<sup>2</sup> (GCIS 2004), which corresponds to 10.2% of the total surface area of SA and 9.8% of the the total area of SA, L and SW. Biome Units

involved: 3 (Savanna, Grassland and Forest) (Mucina & Rutherford 2006). Recorded butterfly fauna falls into: 5 families, 17 subfamilies, 127 genera, 361 species and 8 additional subspecies (369 taxa). Shared endemic genera: 8. Exclusive endemism: 10 species and 8 subspecies (18 taxa). Shared endemism: 31 species and 7 subspecies (38 taxa). Proposed Red List taxa: 9 (all endemic to LP).

### Red List of Limpopo Province

#### Nymphalidae

*Telchinia induna salmontana*  
*Dingana clara*  
*Dingana jerinae*  
*Pseudonympha swanepoeli*

#### Lycaenidae

*Alaena margaritacea*  
*Aloeides stevensoni*  
*Anthene juanita*  
*Erikssonina acraeina*  
*Lepidochrysops lotana*

### Limpopo butterfly hot spots Wolkberg

*Aloeides stevensoni*  
*Dingana clara*  
*Lepidochrysops lotana*

## Threatened butterflies of Mpumalanga Province (M)

Compiled by G.A. Henning, A.I. Curle, N.I. Curle, J.B. Ball & R.F. Terblanche

Surface area of M: 74 490 km<sup>2</sup> (GCIS 2004), which corresponds to 6.5% of the total area of SA and 5.9% of the total area of SA, L and SW. Biome Units: 3 (Grassland, Savanna and Forest) (Mucina & Rutherford 2006). Recorded butterfly fauna falls into: 5 families, 17 subfamilies, 124 genera, 367 species and 6 additional subspecies (374 taxa). Shared endemic genera: 10. Exclusive endemism: 9 species and 3 subspecies (12 taxa). Shared endemism: 47 species and 14 subspecies (62 taxa). Proposed Red List taxa: 11 (7 of which are exclusively endemic to M).

### Red List of Mpumalanga Province

#### Nymphalidae

*Dingana fraterna*

#### Lycaenidae

*Aloeides barbarae*  
*Aloeides nubilus*  
*Aloeides rossouwi*  
*Chrysoritis aureus*  
*Lepidochrysops irvingi*  
*Lepidochrysops jefferyi*  
*Lepidochrysops rossouwi*  
*Lepidochrysops swanepoeli*

**Hesperiidae**

*Metisella meninx*  
*Platylesches dolomitica*

**Mpumalanga butterfly hot spots  
Mountainlands Nature Reserve near Barberton**

*Aloeides barbara*  
*Lepidochrysops jefferyi*  
*Lepidochrysops swanepoeli*

**Escarpment southwest of Stoffberg**

*Dingana fraterna*  
*Aloeides rossouwi*  
*Lepidochrysops rossouwi*

**Threatened butterflies of  
the Northern Cape Province (NC)**

Compiled by R.F. Terblanche, J.B. Ball & G.A. Henning

Surface area of NC: 361 830 km<sup>2</sup> (GCIS 2004), which corresponds to 29.7% of the total area of SA and 28.6% of the total area of SA, L and SW. Biome Units involved: 6 (Desert, Succulent Karoo, Nama-Karoo, Savanna, Grassland and Forest) (minute remnants of Afromontane forest in Oorlogskloof, south of Nieuwoudtville) (Mucina & Rutherford 2006). Recorded butterfly fauna falls into: 5 families, 16 subfamilies, 74 genera, 179 species, 15 subspecies (194 taxa). Shared endemic genera: 12. Exclusive endemism: 19 species and 10 subspecies (29 taxa). Shared endemism: 50 species and 11 subspecies (61 taxa). Proposed Red List taxa: 2.

**Red List of the Northern Cape Province****Lycaenidae**

*Anthene lindae*  
*Chrysoritis trimeni*

**Threatened butterflies of  
the North West Province (NW)**

Compiled by G.A. Henning, P.S. Roos, J.B. Ball & R.F. Terblanche

Surface area of NW: 116 329 km<sup>2</sup> (GCIS 2004), which corresponds to 9.5% of the total area of SA and 9.2% of the total area of SA, L and SW. Biome Units involved: 2 (Savanna and Grassland) (Mucina & Rutherford 2006). Recorded butterfly fauna falls into: 5 families, 16 subfamilies, 84 genera, 191 species and 2 subspecies (193 taxa). Shared endemic genera: 1. Exclusively endemic species or subspecies: none. Shared endemism: 12 species and 3 subspecies (14 taxa). Proposed Red List taxa: 4.

**Red List of the North West Province****Lycaenidae**

*Lepidochrysops hypopolia*  
*Lepidochrysops praeterita*

**Hesperiidae**

*Metisella meninx*  
*Platylesches dolomitica*

**North West butterfly hot spots  
Potchefstroom area**

*Metisella meninx*  
*Lepidochrysops hypopolia*  
*Lepidochrysops praeterita*

**South of Carletonville**

*Platylesches dolomitica*  
*Lepidochrysops praeterita*

**Threatened butterflies of  
the Western Cape Province (WC)**

Compiled by J.B. Ball, D.A. Edge & R.F. Terblanche

Surface area of the WC: 129 370 km<sup>2</sup> (GCIS 2004), which corresponds to 10.6% of the total area of SA and 10.2% of the total area of SA, L and SW. Biome Units involved: 4 (Fynbos, Succulent Karoo, Nama-Karoo and Forest) (Mucina & Rutherford 2006). Recorded butterfly fauna falls into: 5 families, 15 subfamilies, 82 genera, 236 species and 43 subspecies (279 taxa). Shared endemic genera: 16. Exclusive endemism: 72 species and 31 subspecies (103 taxa). Shared endemism: 75 species and 14 subspecies (89 taxa). Proposed Red List taxa: 20 (exclusive to the WC, of which 1 is extinct).

**Nymphalidae**

*Stygionympha dicksoni*

**Lycaenidae**

*Aloeides carolynnae aurata*  
*Aloeides carolynnae carolynnae*  
*Aloeides lutescens*  
*Aloeides thyra orientis*  
*Aloeides trimeni southeyae*  
*Chrysoritis dicksoni*  
*Chrysoritis thysbe mithras*  
*Chrysoritis thysbe schloszae*  
*Chrysoritis rileyi*  
*Lepidochrysops methymna dicksoni*  
*Orachrysops niobe*  
*Thestor brachycerus brachycerus*  
*Thestor dicksoni malagas*  
*Trimenia malagrida malagrida*  
*Trimenia malagrida paarlensis*  
*Trimenia wallengrenii gonnemoui*  
*Trimenia wallengrenii wallengrenii*

**Hesperiidae**

*Kedestes barberae bunta*  
*Kedestes lenis lenis*

**Western Cape butterfly hot spots****Knysna area***Thestor brachycerus brachycerus**Aloeides thyra orientis**Chrysoritis thysbe mithras**Orachrysops niobe***Brandvlei area***Aloeides lutescens**Chrysoritis rileyi***Cape Flats area***Kedestes barberae bunta**Kedestes lenis lenis*



# Reviews of threatened species

Specific localities and GPS readings are not presented in this Red Data Book. Such data are available from Lepsoc and will be made available to conservation bodies. It was thought prudent by the editors that such data should not be published here and that conservation protocols be left in the hands of the various conservation bodies.

## SUPERFAMILY Papilionoidea

FAMILY Nymphalidae

SUBFAMILY Heliconiinae

TRIBE Acraeini

SUBTRIBE Actinotina

GENUS *Telchinia* Hübner, [1819]

(= *Hyalites* Doubleday, 1848. Silva-Brandão *et al.* 2008.)

### *Telchinia induna* (Trimen, 1895)

**Type locality** [Zimbabwe]—'Mashunaland, Salisbury'.

**Common name** Induna Acraea.

**Distribution** Zambia, Malawi, Zimbabwe, SA.

#### ECOLOGY

**Range & population** A widespread woodland species with two subspecies. The southern subspecies is a relict population in a high-altitude refuge and is threatened.

**Habitat** Woodland and montane grassland (nominated subspecies); Soutpansberg Summit Sourveld (subspecies *Telchinia induna salmontana*).

**Habits** The flight is slow and leisurely, in keeping with the aposematic colouration. Both sexes can be seen feeding at flowers.

**Flight period** Recorded throughout the year in more tropical climates, March to May in the case of the southern subspecies, *Telchinia induna salmontana*.

**Early stages** Notes on the early stages are given by G.A. Henning in Pringle *et al.* (1994). Larval food: *Aeschynomene* species; *A. nodulosa* (Baker) Baker f. (Fabaceae) (Pringle *et al.* 1994).

### *Telchinia induna salmontana* G.A. Henning & S.F. Henning, 1996

**Type locality** [SA: LP]—'Witvlag, Zoutpansberg'.

**Common name** Soutpansberg Acraea, Soutpansberg-rooitjie (A).

**Status** Vulnerable [VU B2ab(iii)].

**Distribution** SA: LP—Soutpansberg Mountains.

#### ECOLOGY

**Range & population** This taxon is found at high elevations in the Soutpansberg Mountains of the Limpopo Province. The butterfly has been found only at a few localities and in limited numbers.

**Habitat** This taxon is found in mountain sourveld, on the higher peaks in the Soutpansberg Mountains of the Limpopo Province. The vegetation type is Soutpansberg Summit Sourveld in the Grassland Biome Unit (Mucina & Rutherford 2006). The percentage of this vegetation type that is conserved is 12.6% (Van Rooyen & Bredenkamp 1996). This habitat is in the Soutpansberg Centre of Plant Endemism (Van Wyk & Smith 2001).

**Habits** Adults fly along exposed high rocky ridges where the food plant grows. Males establish territories along the rocky ridges where they patrol back and forth. The adult butterflies drink nectar from small daisy-like flowers in dells between ridges (G.A. Henning & S.F. Henning 1996b). Further study is needed.

**Early stages** Described by G.A. Henning in Pringle *et al.* (1994). Larval food: *Aeschynomene nodulosa* (Baker) Baker f. (Fabaceae) (G.A. Henning in Pringle *et al.* 1994).

#### RATIONALE

This isolated subspecies is found only at a few localities at high altitudes on the Soutpansberg. Much of the grassland has already been transformed by commercial timber plantations and ongoing land clearance for agriculture (Van Wyk & Smith 2001). There appears to have been a declining population (no discrete subpopulations known) since 1989, based on anecdotal observations of a number of naturalists. This taxon has fairly narrow habitat specificity and moderate abundance. No habitat management for this localised subspecies in the Soutpansberg exists. This butterfly was described in 1996 (though known for much longer) and was therefore not included in S.F. Henning & G.A. Henning (1989) or in the subsequent Red List updates.

#### THREATS

Plantation forestry with its consequent habitat modification is the major threat. More data on its ecology and distribution are needed. In

general, better synchronisation of the knowledge about threatened taxa is needed by conservation authorities in respect of the habitat destruction caused by forestry, mining, agriculture and other 'developmental' activities. Modern farming practices have led to a lowered fire frequency in the area, with consequent impoverishment of biodiversity. The ecosystem status of the habitat, from a vegetation perspective, is Vulnerable (Rouget *et al.* 2004).

#### CONSERVATION

No conservation measures have been implemented. There are various conservation and forestry reserves on the Soutpansberg that may house populations of this butterfly but further research is needed. Autecological study coupled with ongoing quantifiable data as well as a well-considered management plan and monitoring is needed.

SUBFAMILY Satyrinae

TRIBE Satyrini

SUBTRIBE Uncertain

GENUS *Pseudonympha* Wallengren, 1857

An Afrotropical genus containing 15 species, confined to southern Africa.

#### *Pseudonympha paragaika* Vári, 1971

**Type locality** [SA: FS]—'Golden Gate Highlands National Park'.

**Common name** Golden Gate Brown, Golden Gate-bruintjie (A).

**Status** Vulnerable [VU D2].

**Distribution** SA: FS—this species is found only in the Golden Gate Highlands National Park.

#### ECOLOGY

**Range & population** Southern aspects of the sandstone buttresses of the Golden Gate Highlands National Park. This butterfly has a far smaller known range than the other satyrine discovered at the same locality, *Torynesis orangica* Vári.

**Habitat** This insect is found in south-facing montane grassland with rocky ridges in Eastern Free State Sandy Grassland of the Mesic Highveld Grassland Bioregion (Mucina & Rutherford 2006). The altitudinal band where adults of this species are found, is between 2 000 and 2 400 m. The predominant grass in its habitat is a tall *Merxmuellera* sp. (Poaceae).

**Habits** *Pseudonympha paragaika* serves as a good example of a butterfly that evolved on a montane island, since the mountains at Golden Gate and Clarens form a small outlier of the Maloti Mountains nearby. It has a very distinctive flight, low and direct with frequent changes in direction. The males patrol grass-covered rocky ridges halfway up the mountain whereas females are more often found below the rocky ridges (S.F. Henning & G.A. Henning 1989). Few

individuals are normally encountered. No published quantitative data are available.

**Flight period** December and January.

**Early stages** When searching for oviposition sites females flutter between the metre high clumps of *Merxmuellera* grass and lay eggs singly on the wire-like blades (Williams, unpublished 2001 in Williams 2007). Larval food: *M. stricta* (Schröd.) Conert (Poaceae) (Kroon, 1999).

#### RATIONALE

Although *Pseudonympha paragaika* occurs in a national park, it is not necessarily safe from a decline in numbers in the near future. In the face of the possible effects of global warming and the lack of a proper management plan for the butterfly at its well-visited habitat (danger of trampling by tourists), this species may become Critically Endangered in a very short space of time. It was listed as Rare in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b).

#### THREATS

The exceptionally restricted area where the butterfly occurs is well visited by tourists, so trampling is a possible threat. Possible encroachment of the perennial shrub *Leucosidea sericea* Eckl. & Zeyh. (Rosaceae) into the habitat of the butterfly could have an impact on it in the future. Appropriate fire regimes have to be maintained. The ecosystem status of the habitat, from a vegetation perspective, is Least Threatened (Rouget *et al.* 2004).

#### CONSERVATION

There is no specific management plan for this butterfly. An appropriate plan formulated in association with the Lepidopterists' Society of Africa would be useful. It would have to be coupled with ongoing monitoring, including population assessments and trends. This has to be associated with the similar needs of the Golden Gate Widow butterfly, *Torynesis orangica*. The known range of *Pseudonympha paragaika* is considerably smaller than the range of its food plant. Every effort should be made to discover more localities of *P. paragaika* since only one very restricted population is known.

#### *Pseudonympha swanepoeli* Van Son, 1955

**Type locality** [SA: LP]—'Woodbush Village (Houtbosdorp), Pietersburg district, Transvaal'.

**Common name** Swanepoel's Brown, Swanepoel-bruintjie (A).

**Status** Critically Endangered [CR B2ab(i,ii,iii,iv,v)].

**Distribution** SA:LP: the species is limited to the type locality.

#### ECOLOGY

**Range & population** Known only in the recent past from a single marshy locality in extremely small

numbers. Not known to occur elsewhere; previously known localities reported by Swanepoel have been destroyed by forestry and invasive plants.

**Habitat** This taxon occurs in a single degraded marshy area in Woodbush Granite Grassland (Mucina & Rutherford 2006), at an altitude of about 2 000 m in the Wolkberg Mountains, near Houtbosdorp. This habitat is separated from the Mpumalanga populations of its closest relative, *Pseudonympha varii* (Van Son, 1955), by the Groot Letaba and Olifants River valleys.

**Habits** Little is known. This species is found in the Wolkberg Centre of Plant Endemism (Van Wyk & Smith 2001). The larval host plant is unknown. It will most likely be a grass (Poaceae) occurring in the butterfly's marshy habitat. Connectivity with adjacent marshes has been excluded by the activities of commercial afforestation and encroachment by alien trees. Although adjacent indigenous forest is well preserved, the intervening grassy and marshy areas have been degraded by afforestation of alien species by the Department of Forestry (Curle & Curle 1995). Frequent fires are needed to maintain grassland integrity and the associated biodiversity.

**Flight period** February and March.

**Early stages** No published information available on early stages or larval host plant.

#### RATIONALE

This butterfly is now known from only one population at one locality near Houtbosdorp, near Woodbush, in the Limpopo Province. It has been seen only in extremely small numbers over the last 20 years and is probably on the brink of extinction. It was listed as Rare in S.F. Henning & G.A. Henning (1989) and as Indeterminate in G.A. Henning & S.F. Henning (1992b). There has been an ongoing declining population trend since before the previous listings. There are a few closely related and undescribed taxa in the *Pseudonympha varii* species complex in Mpumalanga (Curle & Curle 1995). This species has very narrow habitat specificity, a small geographic range and exceedingly low abundance.

#### THREATS

Afforestation (mainly *Pinus* species) and invasion of alien plant species, mainly from plantations, including pine trees, *Pinus* species (Pinaceae), oaks, *Quercus* species (Fagaceae) and black wattle, *Acacia mearnsii* De Wild. (Fabaceae) (Curle & Curle 1995; A. Curle, pers. comm. 2004). This has also altered the normal natural fire cycles, with active fire suppression. It is ironic that the focus of conservation measures in the Wolkberg Centre of Plant Endemism have been mainly concerned with the patches of Afromontane forest. The endemic-rich grasslands, however, have to a certain extent been both neglected and obliterated. This has been both passive (by not controlling alien plant infestation) and active (through afforestation) by the timber industry (Matthews *et al.* 1993). The

ecosystem status of the habitat, from a vegetation perspective, is Endangered (Rouget *et al.* 2004).

#### CONSERVATION

No measures have been implemented. Only urgent and drastic clearing of alien trees from the larger habitat will have any effect on efforts to save this species. Fires in and around the marshy areas would stimulate the senescent grassland structure and remnant phytodiversity (and thus invertebrate diversity). Conservation action may already be too late. On the Wolkberg the locality is next to the Woodbush Forest Reserve but is apparently not part of it.

#### GENUS *Stygionympha* Van Son, 1955

A southern African genus containing nine species.

#### *Stygionympha dicksoni* (Riley, 1938)

**Type locality** [SA: WC]—'Tygerberg Hills, near Cape Town, S. Africa'.

**Common name** Dickson's Brown, Dickson-bruintjie (A).

**Status** Critically Endangered [CR B1ab(i,ii,iii,iv,v)+2ab (i,ii,iii,iv,v)].

**Distribution** SA: WC—Swartland.

#### ECOLOGY

**Range & population** Used to occur in the southern and western gullies of the Tygerberg Hills, east of Cape Town. Was found on a few renosterveld-covered hills near Darling, but has not been seen for several years. Prior to this, it was known only from extremely few sightings. Last known locality was the Kapokberg, just south of Darling.

**Habitat** Was found in Swartland Shale Renosterveld (Mucina *et al.* 2005), also known as West Coast Renosterveld (Newton & Knight 2004), in the Fynbos Biome (Mucina & Rutherford 2006), on low hills between the Tygerberg Hills and in Swartland Granite Renosterveld (Mucina & Rutherford 2006) near Darling, in small numbers. Renosterveld often has an open, grassy understorey (Cowling & Holmes 1992), is very non-homogeneous, and is characterised by the presence of *renosterbos*, *Elytropappus rhinocerotis* (L.f.) Less. (Koekemoer 2002). Geophyte-rich renosterveld is prone to fire; it also has very few members of the Proteaceae in it, and its geological base is clay-rich. More than 70% of the original extent of renosterveld has been replaced by agriculture (Cowling & Richardson 1995). For West Coast Renosterveld, this figure of destruction is 95% (Low & Rebelo 1998). The larval host plant (see Early stages, below) is quite plentiful on the Kapokberg near Darling.

**Habits** The butterfly is able to maintain sustained flight and appears to favour the higher western and southern slopes of hills (Pringle *et al.* 1994). Very little is known about its ecology.

**Flight period** The adults emerge in early September.

**Early stages** No published information available on the early stages. *Tribolium echinatum* (Thunb.) Renvoize (Poaceae) has been recorded as a larval host plant (Dickson in Pringle *et al.* 1994).

#### RATIONALE

Currently known only from a single population from one locality, near the town of Darling, in the Swartland of the Western Cape. Very few specimens have been seen there over the last 20 years. Listed as Rare in S.F. Henning & G.A. Henning (1989) as well as in G.A. Henning & S.F. Henning (1992b). There has been a declining population trend over the last 30 years. *Stygionympha dicksoni* was one of 16 butterfly species that were added to Schedule 2 of the list of protected wild animals in the Cape Province in 1976 (Ordinance No. 19 of 1974). However, owing to habitat destruction and lack of a conservation plan, the species seems to be on the verge of extinction.

#### THREATS

Habitat degradation and fragmentation due to farming, invasive alien vegetation, housing and mining are the major threats. A vast quarry on the western side of the Tygerberg Hills literally obliterated the type locality. We do not know whether the changes to a warmer and drier climate over the last few years have already had an impact on this taxon or not. If Renosterveld receives less than 250 mm of rain per annum, it tends to be replaced by Succulent Karoo vegetation (Van Wyk & Smith 2001). Renosterveld thus tends to be found in an ecotone between Fynbos and Succulent Karoo, and global warming will impact on these vegetation types. The ecosystem status of the habitats, from a vegetation perspective, is Critically Endangered (Rouget *et al.* 2004).

#### CONSERVATION

No measures are currently being implemented, and the window of opportunity for conservation measures to succeed may already have passed. If no conservation action is taken urgently, *Stygionympha dicksoni* may become one of the most striking examples of a butterfly species that appeared on a list of legally protected taxa, only to become extinct a few decades later owing to continued loss of suitable habitat. Considerable study is needed, including searches for new localities, in addition to quantifiable information on habitat structure, ecosystem processes and population numbers and trends.

#### SUBTRIBE *Dirina*

The subtribe *Dirina* is endemic to the temperate areas of southern Africa.

GENUS *Dingana* Van Son, 1955

#### *Dingana clara* (Van Son, 1940)

**Type locality** [SA: LP]—'Wolkberg, Pietersburg district, Transvaal'.

**Common name** Wolkberg Widow, Wolkberg-weduwee (A).

**Status** Vulnerable [VU D2].

**Distribution** SA: LP—Wolkberg, Legalameetse Nature Reserve.

#### ECOLOGY

**Range & population** Has an extent of occurrence of less than 1 000 km<sup>2</sup>. The area of occupancy of the three known localities is considerably smaller than this. The total population is estimated at less than 10 000 adults during a favourable season. No other quantitative data are available.

**Habitat** This satyrine is found in Northern Escarpment Quartzite Sourveld of the Mesic Highveld Grassland Bioregion within the Grassland Biome Unit (Mucina & Rutherford 2006). This is in the Wolkberg Centre of Plant Endemism (Van Wyk & Smith 2001). The area is dominated by montane grassland and isolated stands of *Protea* spp., including *P. rubropilosa*, shrubs and trees. Pockets of Afromontane forest are found on the slopes of the main escarpment.

**Habits** The adults are univoltine, flying on steep, rock-strewn, grassy slopes at high elevations among proteas. The species can be found flying in numbers in favourable years. The larval food plant has not been noted in the wild. No quantitative data on the vegetation, habitat structure or ecosystem processes required to maintain a suitable habitat, are available.

**Flight period** Late September to early November.

**Early stages** The early stages are described in Van Son (1955). The egg has been described by G.A. Henning & S.F. Henning (1996a). *Ehrharta erecta* Lam. (Poaceae) has been used as a larval host plant in captivity (Van Son 1955).

#### RATIONALE

This taxon is known only from four small montane localities where it is found to be localised. Therefore both the extent of occurrence and the area of occupancy comprise very small areas for such a relatively large butterfly. No habitat management plan is in place to manage ecological processes that create a suitable habitat. This insect was not listed in S.F. Henning & G.A. Henning (1989) or in G.A. Henning & S.F. Henning 1992b, 1995). The population trend appears to be stable.

#### THREATS

*Dingana clara* is known only from four localities that are subject to human impact such as too frequent fires and habitat destruction. The habitat could also be damaged or modified by the spread of human development at one of its localities. The ecosystem status of the habitats, from a vegetation perspective, is Vulnerable (Rouget *et al.* 2004).

#### CONSERVATION

Two of the localities are in the Legalameetse Nature Reserve. There is currently no management geared

towards this species, but suitable intervention has to be made, including ongoing monitoring. The Lepidopterists' Society of Africa would be the appropriate organisation to assist in formulating a management plan. An appropriate fire regime is needed, coupled with vigilance with regard to possible development and alien invasive vegetation or inappropriate commercial afforestation. Less than 1% of the montane grasslands of the Wolkberg Centre of Plant Endemism is conserved (Van Wyk & Smith 2001).

### *Dingana dingana* (Trimen, 1873)

**Type locality** [SA: KZN]—'Malan Spruit, Natal'.

**Common name** Dingaan's Widow, Dingaan-weduwee (A).

**Status** Vulnerable [VU B2ab(iii)]

**Distribution** SA: KZN—from the Drakensberg foothills to the KwaZulu-Natal midlands.

#### ECOLOGY

**Range & population** This taxon has been found from the Drakensberg foothills in the west, eastwards to the Estcourt, Mooi River and Greytown areas. The greatest number of existing habitats is in the Estcourt and Mooi River regions. The extent of occurrence is about 1 500 km<sup>2</sup>, but the area of occupancy is considerably smaller. Suitable habitats are becoming more fragmented and there is a declining population trend.

**Habitat** This butterfly is found amongst rocky ridges in the Grassland Biome Unit in the vegetation type named Mooi River Highland Grassland of the Sub-Escarpment Grassland Bioregion (Mucina & Rutherford 2006) in the midlands of KwaZulu-Natal.

**Habits** The early stages of the larval life cycle were noted by Clark in Van Son (1955). Autecological data are needed, combined with quantitative information on population numbers, population trends, habitat structure and ecological processes.

**Flight period** September to November.

**Life history:** Early stages by Clark in Van Son (1955). Larval food: in captivity bred on *Pennisetum clandestinum* Hochst. ex Chiov. (Poaceae).

#### RATIONALE

Relatively few localities and subpopulations of this butterfly remain in the midlands of KwaZulu-Natal. Much habitat degradation has occurred in the general region, owing to agriculture and alien commercial afforestation. This butterfly was previously regarded as being rather widespread. However, a number of species were found to be present within a species complex (G.A. Henning & S.F. Henning 1996a). This taxon was not listed in S.F. Henning & G.A. Henning (1989) or in G.A. Henning & S.F. Henning (1992b, 1995). There has been a declining population trend, based on numbers of specimens recorded during site

visits over the last 10 years. No localities have been found in conservation areas.

#### THREATS

The main threats are agricultural activity as well as commercial afforestation of *Eucalyptus* species (Myrtaceae) and *Pinus* species (Pinaceae). This has been coupled with a lack of habitat connectivity and habitat fragmentation. Changed fire frequency due to adjacent plantations is also a threat. The ecosystem status of the habitats, from a vegetation perspective, varies from Vulnerable to Least Threatened (Rouget *et al.* 2004).

#### CONSERVATION

There are no conservation measures in place. None of the known localities are in nature reserves.

### *Dingana fraterna* G.A. Henning & S.F. Henning, 1996

**Type locality** SA: M—'South Africa: Mpumalanga, Stoffberg'.

**Common name** Fraternal Widow, Broederlike-weduwee (A).

**Status** Endangered [EN B1ac(iv)+2ac(iv); C2a(ii)]

**Distribution** SA: M—Stoffberg.

#### ECOLOGY

**Range & population** Known only from the type locality, which is southwest of the town of Stoffberg, Mpumalanga Province, where it is found only on a few hectares of rocky grassland.

**Habitat** The vegetation type of the habitat is Rand Highveld Grassland of the Mesic Highveld Grassland Bioregion in the Grassland Biome Unit (Mucina & Rutherford 2006). The species is found between 1 600 and 1 700 m in grassy patches amongst *Protea* species on the rocky eastern side of the plateau.

**Habits** Adults emerge at about 09:00 in the morning and usually disappear from sight by 11:00. The area faces south to southeast and is at an elevation of 1 600 to 1 700 m. The type locality is along a very steep, convex, rocky ridge at the base of a deep valley on the eastern edge of the highveld plateau. The species only flies for about 10 days in early October. It is never seen in numbers; there are usually fewer than 10 specimens seen on any one day.

**Flight period** The species is univoltine, with adults flying for only about 10 days in early October.

**Early stages** G.A. Henning & S.F. Henning (1996a) (egg only). Larval food: unidentified grass species (observed oviposition).

#### RATIONALE

Habitat change in the near future may cause this butterfly species to become critically endangered in

a short space of time. No other localities have been found despite exploration of the Stoffberg area by lepidopterists in recent years. This satyrine has fairly narrow habitat specificity, based on the restricted area inhabited, a small geographic range and moderate abundance. It was described in 1996 and is therefore not listed in S.F. Henning & G.A. Henning (1989) or in G.A. Henning & S.F. Henning (1992b, 1995). There appears to have been a stable population trend since 1996, the site having been visited annually for about six years after its description. No recent records are available. No conservation management practices are in place.

#### THREATS

All of the above factors combine to make the existence of this species a very precarious one. The possibility of inappropriate fires constitutes a very real risk from the perspective of the ecology of this satyrine. Mining operations in the vicinity might induce changes to the habitat caused by airborne pollutants. The ecosystem status of the habitat, from a vegetation perspective, is Endangered (Rouget *et al.* 2004).

#### CONSERVATION

Extensive research has to be done on this species to determine the reasons for its restricted distribution. Management procedures have to be implemented once a profile has been compiled as to its needs.

### *Dingana jerinae* G.A. Henning & S.F. Henning, 1996

**Type locality** SA: LP—'Limpopo Province, Kransberg'.

**Common name** Jerine's Widow, Jerine-weduwee (A).

**Status** Vulnerable [VU D2].

**Distribution** SA: LP—Kransberg.

#### ECOLOGY

**Range & population** Known from the type locality and another population 3 km to the west of the type locality. The type locality comprises several hectares, high on the Kransberg. The other locality is much larger and has an extent of some tens of hectares. A few hundred adult specimens are noted every season.

**Habitat** This is situated at high altitude (1 850 to 2 000 m), on the southeast-facing rocky/grassy slopes of the Kransberg in the Waterberg, Limpopo Province. The vegetation type is classified as Waterberg-Magaliesberg Summit Sourveld of the Mesic Highveld Grassland Bioregion in the Grassland Biome Unit (Mucina & Rutherford 2006). A few proteas occur in the area.

**Habits** Adults fly on very steep slopes, below high cliffs, among fallen rocks as well as in rocky terrain on the summits. The species appears to have adapted to the high temperatures prevailing in the area by flying

early in the morning and retiring before midday. Some observations on predator damage were published (Curle & Henning 1996), but further autecological and synecological data are needed.

**Flight period** The adults fly from the middle of November to the middle of December (Garvie, Williams & McDermott, pers. obs. 2007).

**Early stages** The egg has been described by G.A. Henning & S.F. Henning (1996a). In captivity, larvae were reared on *Pennisetum clandestinum* Hochst. ex Chiov. (Poaceae) (G.A. Henning & S.F. Henning 1996a).

#### RATIONALE

Most of the known habitat of *Dingana jerinae* falls just outside the Marakele National Park on the Kransberg part of the Waterberg Mountains, but specimens from the second locality have been seen within the Park. As the localities are situated in a pristine area, no detailed conservation management practices are in place. The species has a fairly narrow habitat specificity being restricted to a relatively small area and in fairly high abundance. This butterfly was described after S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b, 1995) and had therefore not been listed previously. A stable population trend has been observed during frequent annual visits after the description of the species.

#### THREATS

No imminent threats. Habitat modification and widespread fires during the emergence of the adults could have deleterious consequences. The ecosystem status of the habitat, from a vegetation perspective, is Least Threatened (Rouget *et al.* 2004).

#### CONSERVATION

No conservation measures are in place. A small part of the colony is in a national park, and a private hiking trail runs through another part. Further study is needed.

FAMILY Lycaenidae

SUBFAMILY Poritiinae

TRIBE Liptenini

SUBTRIBE Pentilina

GENUS *Alaena* Boisduval, 1847

A purely Afrotropical genus containing 23 species.

### *Alaena margaritacea* Eltringham, 1929

**Type locality** [SA: LP]—'Haenertzburg' [*sic; recte*: Haenertsburg].

**Common name** Wolkberg Zulu, Wolkberg-zoeloe (A).

**Status** Critically Endangered [CR A3ce; B2ab(i,ii,iii,iv,v)].

**Distribution** SA: LP—known only from the type locality.

## ECOLOGY

**Range & population** Known only from one very restricted area near the 'black forest' in the vicinity of Haenertsburg on the Wolkberg, Limpopo Province, on steep rocky, grassy slopes. In good seasons this small locality can have a large population of several hundred adults flying.

**Habitat** The secluded colony is found on steep grassy slopes with lichen-covered rocks. It is located in the vegetation type known as Woodbush Granite Grassland of the Mesic Highveld Grassland Bioregion in the Grassland Biome Unit (Mucina & Rutherford 2006). The breeding area is about 400 m below the peaks (S.F. Henning & G.A. Henning 1989).

**Habits** The female lays her eggs on rocks, usually covered by the appropriate lichen, which probably is the food plant. Adult males do some 'almost-hilltopping' near midday when they congregate at the higher rocks in the colony. This is where some male territoriality may be displayed. The flight, although weak, can be sustained. The ecology was reviewed in S.F. Henning *et al.* (1993c).

**Flight period** December and January.

**Early stages** Described by Clark & Dickson (1971) (in part) and S.F. Henning & G.A. Henning (1989). Larval food: rock lichens (Lichenes) (Clark & Dickson 1971); algae (Cyanophyta) growing on rocks (Pringle *et al.* 1994).

## RATIONALE

Since its discovery, *Alaena margaritacea* has been known to occur only in a very restricted area in the northern part of the Wolkberg near Haenertsburg. The high grassy slopes where the butterfly occurs are under severe threat from plantations, and the habitat is currently degraded. The population numbers have plummeted from many hundreds in the 1980s to less than 50 in 2003, while in 2004 a couple of hundred have been noted (M. Williams, pers. comm. 2004). Previously listed as Vulnerable in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b). There has been a significant declining population trend since 1989. This taxon has very narrow habitat specificity, a very small geographic range and low abundance.

## THREATS

Numbers have been dwindling as the habitat is becoming overgrown from the adjacent forest. Plantation forestry has all but destroyed the last known colony of this insect. There are *Eucalyptus* species (Myrtaceae) growing higher up on the hill, contributing to drying the natural seepage at the habitat of this critically endangered butterfly. Trees of a *Pinus* species (Pinaceae) have also been planted lower down around the base of the locality, with a concomitant suppression of natural fires required by this type of fire-dependent grassland. The ecosystem status of the habitat, from a vegetation perspective, is Endangered (Rouget *et al.* 2004).

## CONSERVATION

No conservation measures are currently in force. A buffer zone of natural, managed vegetation has to be urgently established, with a radius of a few hundred metres of the sole remaining colony. Alien plantation trees have to be removed from this buffer zone. The management plan will need appropriate intermittent mosaic block-burning of the habitat of the species. Significant thought has to be given to connectivity with some of the previous habitats (this will need removal of alien vegetation).

### SUBTRIBE *Durbaniina*

#### GENUS *Durbania* Trimen, 1862

A purely Afrotropical genus containing two species.

#### *Durbania amakosa* Trimen, 1862

**Type locality** [SA: EC]—'King William's Town and Windvogelberg'.

**Distribution** SA, SW.

## ECOLOGY

**Range & population** There are seven subspecies, three of which are threatened.

**Habitat** Inhabits rocky areas along the eastern part of South Africa.

**Habits** Adults are sedentary, keeping to the rocks on which their larval food plant grows.

**Early stages** Described by Trimen & Bowker (1887), Murray (1935), Clark & Dickson (1971) and S.F. Henning (1983a). Larval food: rock lichen (Lichenes) (Clark & Dickson 1971); algae (Cyanophyta) on rocks (Pringle *et al.* 1994).

#### *Durbania amakosa albescens* Quickelberge, 1981

**Type locality** SA: [KZN]—'Margate, Natal South Coast, at 30°51'S., 30°22'E'.

**Common name** Coastal Rocksitter, Kus-klipsitter (A).

**Status** Vulnerable [VU A3c; B2ab(i,ii,iii,iv)].

**Distribution** SA: KZN—inland of Margate and Port Edward.

## ECOLOGY

**Range & population** This subspecies has an extent of occurrence of about 50 km<sup>2</sup>. It is found from near Margate southwards to near Port Edward, in southern KwaZulu-Natal. The area of occupancy is considerably smaller than the extent of occurrence. The combined adult population is probably less than 3 000 specimens per year, based on a daily record of about 60 specimens per site, flying for a period of three to four weeks, with population turnover of about five days in eight colonies. Study is needed to better quantify these figures and to monitor them over time.

**Habitat** Rocky coastal grassland with associated rocks containing the needed lichen as well as algae. The Biome Unit is known as the Indian Ocean Coastal Belt; the specific vegetation type is designated Pondoland-Ugu Sandstone Coastal Sourveld (Mucina & Rutherford 2006).

**Habits** Adults of this cryptic and fairly sedentary butterfly are weak fliers and spend much time on lichen-covered rocks in grassland. Larvae feed on crustose lichens and algae. The lichens have colours very similar to those of the underside of the butterfly. The fringe of grass around the rock and soil interface appears to be important in creating a microclimate where larvae often rest during the day, indicating that the successional development and management of the associated grassland is also important. Autecological studies are needed.

**Flight period** November to January.

**Early stages** Unknown.

### RATIONALE

*Durbania amakosa albescens* occurs very close to the coast in patches of rocky grassland from Margate to south of Port Edward. These coastal areas, and especially the unique grassland that occurs there, are under severe and increasing pressure from development. This geographically isolated subspecies, with its distinctive whiter underside, has had a declining population trend since its discovery in 1976 and is known from fewer than 10 very localised localities and subpopulations. It was listed as Rare in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b). A number of localities near Margate have already been destroyed. Adults of this species have a rather weak flight.

### THREATS

The localities inhabited by *Durbania amakosa albescens* are, in most cases, threatened by urban development, leading to increasing habitat fragmentation and isolation. This is decreasing the genetic pool and increasing the chances of inbreeding depression. Air pollution from neighbouring industry is also considered a potential threat, as is the removal of rocks for building purposes. The rocky microhabitat is in grassland, which also needs an appropriate fire regime and management. The ecosystem status of the habitat, from a vegetation perspective, is Endangered (Rouget *et al.* 2004).

### CONSERVATION

Conservation measures are currently being implemented. The associated grassy areas have to be managed, with appropriate fire management. Further monitoring and management is urgently needed. Colonies have been found in the following reserves: Vernon Crookes Nature Reserve, Oribi Gorge Nature Reserve and Umtamvuna Nature Reserve. Present localities have to be safeguarded. Some appropriate measures would be to prevent continuous sources of air pollution affecting areas close to the reserve

boundaries, to ensure that the grass surrounding the lichen-covered rock habitat is not burnt every year and not to remove lichen-covered rocks for use elsewhere (e.g. to form stone footpaths).

## *Durbania amakosa flavida* Quickelberge, 1981

**Type locality** SA: [KZN]—‘Shongweni Dam, Natal, at 29°50'S; 30°43'E'.

**Common name** Shongweni Rocksitter, Shongweni-klipsitter (A).

**Status** Endangered [EN A3c; B2ab(i,ii,iii,iv)].

**Distribution** SA: KZN—inland of Durban and in the hills near the Ngoye and Nkandla forests.

### ECOLOGY

**Range & population** This subspecies of *Durbania amakosa* is found from the Shongweni Dam, inland of Durban, to the forest reserves near Nkandla and Ngoye in KwaZulu-Natal. The extent of occurrence is about 2 800 km<sup>2</sup>. The area of occupancy is considerably smaller. Probably less than 1 000 adult specimens emerge per year, based on a daily record of about 30 specimens per site, flying for a period of three to four weeks, with population turnover of about five days in five localities.

**Habitat** This subcoastal subspecies is found on suitable lichen/alga-covered rocks in montane grassland at an altitude between 450 and 900 m. The vegetation types of the habitats include Northern Zululand Sourveld (Lowveld Bioregion) and KwaZulu-Natal Sandstone Sourveld (Sub-Escarpment Savanna Bioregion) of the Savanna Biome Unit (Mucina & Rutherford 2006).

**Habits** See under *Durbania amakosa albescens* above.

**Flight period** November to January.

**Early stages** Unrecorded.

### RATIONALE

Fewer than five localities are documented for *Durbania amakosa flavida*. The butterfly occurs inland from the coast between Durban and the Nkandla area in KwaZulu-Natal. This area is under considerable pressure from development and overgrazing at present. Owing to the decline in numbers at the type locality and elsewhere over the last 10 years and its restricted occurrence in area of occupancy, its future is cause for concern. This subspecies was listed as Indeterminate in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b). The butterfly seems to have disappeared from a number of localities.

### THREATS

The localities inhabited by *Durbania amakosa flavida* are, in most cases, in well-populated areas and are threatened with habitat destruction owing to development, increased grazing and changed

fire practices, which lead to greater habitat fragmentation. The ecosystem status of the habitats, from a vegetation perspective, is Vulnerable (Rouget *et al.* 2004).

#### CONSERVATION

The type locality at Shongweni Dam appears to be protected to some degree. It is not known whether the subspecies occurs within the apparently protected forest reserves at Ngoye and Nkandla. Other areas inhabited are subcoastal hills from about 450 to 900 m above sea level from just inland of Durban, at Kloof, and Inchanga. Present localities have to be safeguarded, and monitoring and management are needed, including controlled levels of grazing and fire frequency.

### *Durbania amakosa sagittata* S.F. Henning & G.A. Henning, 1993

**Type locality** SA: [FS]—‘Southern slope, Qwa-Qwa Mountain’.

**Common name** Qwa-Qwa Rocksitter, Kwa Kwa-klipsitter (A).

**Status** Vulnerable [VU B2ab(iii); D2].

**Distribution** SA: FS—Qwa Qwa Mountain.

#### ECOLOGY

**Range & population** This subspecies has been recorded on Qwa Qwa Mountain. As with all *Durbania* species, its population size can vary greatly according to prevailing weather patterns.

**Habitat** The known range of this subspecies is about 8 km<sup>2</sup>. The population numbers are similar to those of the other subspecies; quantitative data are needed. The adults are found on rocky south-facing slopes in Basotho Montane Grassland of the Mesic Highveld Grassland Bioregion in the Grassland Biome Unit (Mucina & Rutherford 2006) at about 2 000 m above sea level.

**Habits** *Durbania amakosa sagittata* occurs in areas with the required microhabitat of rocks with appropriate humidity, crustose/foliose lichens and algae (larval food), as well as the required fringe of grass and vegetation around the rock and soil interface. The latter seems to be necessary for an appropriate microclimate and microhumidity for the larvae. They mainly feed at night (probably because of the risks associated with absorbed heat and decreased humidity on the rocks during the day). There may also be less predation by day (due to observed movement) as the larvae have long laterally directed hairs, minimising fringe shadows).

**Flight period** November to January.

#### RATIONALE

*Durbania amakosa sagittata* is a recently described subspecies and known only from the type locality. At present this area is under considerable pressure from overgrazing, increased trampling and fire frequency

at present. The type locality is situated adjacent to the densely populated Phuthaditjaba area in the northeastern Free State. No *Durbania* species have been found on the nearby mountains in the Golden Gate Highlands National Park or further north in the Free State. It appears that the distribution of *D. amakosa sagittata* is very restricted and that is also the only subspecies to be found on the western side of the Drakensberg escarpment. Further research may result in its conservation status being raised. As this taxon was only described in 1993, it was not included in S.F. Henning & G.A. Henning (1989) or in G.A. Henning & S.F. Henning (1992b).

#### THREATS

Severe trampling and overgrazing at the type locality may affect the moisture regime at the grass interface with the rocks and with the rock lichen on which the butterfly larvae feed. There is considerable population pressure from the nearby densely populated area. The threats would appear mainly to affect the required microclimate (temperature, moisture and humidity) of the larvae, pupae and adult butterflies. The ecosystem status of the habitat, from a vegetation perspective, is Endangered (Rouget *et al.* 2004).

#### CONSERVATION

With the expansion of the Qwa-Qwa National Park that joins the Golden Gate Highlands National Park, this butterfly subspecies may be protected in the future. Implementation of a habitat management plan and urgent conservation actions are essential for the future of this unique subspecies. At present there are no conservation management plans for this taxon. Appropriate grazing and fire frequency have to be maintained and monitored. An effort has to be made to search nearby mountains for further colonies of this butterfly.

#### GENUS *Durbaniella* Van Son, 1959

A monotypic Afrotropical genus.

### *Durbaniella clarki* (Van Son, 1941)

**Type locality** [SA: WC]—‘Seven Weeks Poort’.

**Common name** Clark’s rocksitter, Clark-klipsitter (A).

**Distribution** SA: WC and EC.

#### ECOLOGY

**Range & population** There are four subspecies, one of which is threatened.

**Habitat** Montane areas in the Fynbos and Karoo Biomes. The rocks that are frequented are of sedimentary origin, except for those utilised by *Durbaniella clarki belladonna*, which are doleritic in origin. The larvae feed on crustose, grey, grey-green or orange-red lichens growing on the rocks. Populations occur at altitudes of 200 to 1 600 m. Average annual rainfall in the localities inhabited varies between 230 and 750 mm.

**Habits** A slow-flying, colony-forming species restricted to areas around the rocks on which its food plant grows. Small populations apparently do not consist of more than 50 individuals. The flight period is in spring and summer.

**Early stages** No published information available. Larvae recorded as feeding on rock lichens (Lichenes).

### *Durbaniella clarki belladonna* Ball, 1994

**Type locality** SA: [EC]—‘30 km N.E. of Jansenville, Eastern Cape’.

**Common name** Ironstone Rocksitter, Ysterklipklipsitter (A).

**Status** Vulnerable [VU D2].

**Distribution** SA: EC—Jansenville.

#### ECOLOGY

**Range & population** Known from two localities approximately 30 km northeast of Jansenville in the Eastern Cape (A. Curle, pers. comm. 2004). The extent of occurrence is about 20 km<sup>2</sup>, but the area of occupancy is considerably smaller. Probably less than 5 000 adult specimens emerge annually, based on 200 individuals seen a day for a flight period of eight to 10 weeks, at a population turnover of about five days at both colonies. Little is known about this taxon.

**Habitat** The butterfly is found on low hills in Sundays Thicket in the Albany Thicket Biome (Mucina & Rutherford 2006). The habitat is fairly close to Lower Karoo Gwarrieveld of the Lower Karoo Bioregion of the Nama-Karoo Biome (Mucina & Rutherford 2006) on south-facing slopes. The microhabitat used by this taxon consists of dolerite rocks (known locally as ‘ysterklip’ due to the high iron silicate content) on which the necessary larval food of orange-red crustose lichens/algae grows (Ball 1994e). Despite the xeric-adapted vegetation containing, for example, *Euphorbia* species (Euphorbiaceae) and the Karoo cycad *Encephalartos lehmannii* Lehm. (Zamiaceae), the butterfly and lichens survive because of frequent evening and early morning valley mist, which condenses on the rocks, coupled with partial shading by trees and shrubs.

**Habits** Adults of this cryptic and fairly sedentary butterfly are weak fliers and spend much time on lichen-covered dolerite rocks. There is often a fringe of vegetation around the base of these rocks, many of which are partially shaded by overhanging vegetation. Atypically, the type of grassy vegetation encountered in the vicinity of the host rocks of other subspecies of this taxon appears to be absent in the case of *Durbaniella clarki belladonna*.

#### RATIONALE

The butterfly is currently known only from two localities or subpopulations, and there is a very restricted area of occupancy of less than 20 km<sup>2</sup>. It was not included in S.F. Henning & G.A. Henning

(1989), but was listed as Rare in G.A. Henning & S.F. Henning (1995). There has been a declining population trend at the type locality since the early 1990s as ascertained from counts during regular visits to the site. Although there are no major present threats, this listing is a precautionary measure. Currently, three other subspecies are recognised, none of which is threatened.

#### THREATS

No present significant threats. Overgrazing, removal or loss of vegetation shading the breeding rocks and climate warming/aridification are possible future risk factors. Moisture for the needed microclimate mainly comes from valley mist. Whether the necessary moisture/humidity gradients will change with climate warming, remains to be seen. The ecosystem status of the habitat, from a vegetation perspective, is Least Threatened (Rouget *et al.* 2004).

#### CONSERVATION

No conservation measures are currently in force or being implemented. Co-operation with the local farmers is needed to prevent the habitat from being modified, as are further autecological studies and quantitative population monitoring.

#### SUBTRIBE *Epitolina*

#### GENUS *Deloneura* Trimen, 1868

A purely Afrotropical genus containing seven species.

### *Deloneura immaculata* Trimen, 1868

**Type locality** [SA: EC]—‘Bashee River, Kaffraria’.

**Common name** Bashee River Buff, Mbashe-geel-velkie (A).

**Status** Extinct [EX].

**Distribution** SA: EC—this insect has been recorded only from a single, fairly remote and obscure locality near Fort Bowker, overlooking the Mbashe River; Holt (1955) mentions this fort.

#### ECOLOGY

**Range & population** Only three female specimens have ever been collected, all at the type locality.

**Habitat** Described as a wooded area along the steep banks of the Mbashe River in the present Eastern Cape. The habitat was possibly in the ecotone between what is now referred to as Eastern Valley Bushveld (of the Sub-Escarpment Savanna Bioregion) and Mthatha Moist Grassland (of the Sub-Escarpment Grassland Bioregion) (Mucina & Rutherford 2006). It is not known how much change the type locality has undergone since 1863.

**Habits** The first specimen was collected on 27 December 1863, and the other two during the remaining days before 1 January 1864. The species has not been seen again, notwithstanding the fact that its discoverer, Colonel J.H. Bowker, remained camped in the area for several months. He himself described the insect as very rare, and only appearing for a few days. In addition, he stated that specimens were also most difficult to procure, owing to their habit of 'whirling slowly with flapping wings round the tops of trees, rising and falling, sailing away and returning'. He was struck by its resemblance to the 'yellow tree-moth', which is common in the forests of the area. This is the type species of the genus *Deloneura*, which is purely Afrotropical, and now consists of six species and two subspecies. Only one further species (*D. millari millari* Trimen) is known to occur in South Africa, and its sedentary habits make it difficult to find, notwithstanding the fact that it is known to occur along the entire eastern coastal region, from Kouga northwards. Individuals of this genus sit for long periods, feeding on the secretions of honeydew from the abdomens of coccids (Hemiptera), and seldom fly unless disturbed, when they normally return quickly to the depths of the foliage. Such habits may account for the many failed attempts by collectors to rediscover *D. immaculata* for more than 140 years. Of the three known specimens, two are in the South African Museum (SAM) in Cape Town, and one is in The Natural History Museum (BMNH) in London.

**Early stages** Unknown.

#### RATIONALE

This taxon was listed as Extinct in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b).

#### THREATS

The species is presumably extinct, so there are no threats. The disappearance of *Deloneura immaculata* is possibly a case of extinction due to natural habitat change, although the mechanisms of such change are not understood. However, adults of *Deloneura* species are often very sedentary and there is extensive poorly investigated riverine forest in the Eastern Cape. Furthermore, a number of insect taxa thought to be extinct in South Africa have recently been rediscovered, stressing the role of field work in determining the conservation status of species considered to be of conservation concern (J. Ball, pers. comm.).

#### CONSERVATION

No conservation measures are required as no locality is known. Further systematic searching in suitable habitat is needed.

SUBFAMILY Theclinae

TRIBE Theclini

SUBTRIBE Deudoricina

GENUS *Capys* Hewitson, 1865

A purely Afrotropical genus containing 16 species.

### *Capys penningtoni* Riley, 1932

**Type locality** [SA: KZN]—'Natal, Inhlozane'.

**Common name** Pennington's Protea-butterfly, Pennington-suikerbossie (A).

**Status** Vulnerable [VU B1ab(ii)+2ab(ii)].

**Distribution** SA: KZN—midlands and Drakensberg.

#### ECOLOGY

**Range & population** Endemic to the KwaZulu-Natal midlands and adjacent foothills of the Drakensberg. Has been found in the 'Little Berg' from Elandskop to Bulwer, and northeastwards to Loteni and the Inhlozane Mountains of the KwaZulu-Natal midlands near Dargle.

**Habitat** The vegetation type is Southern KwaZulu-Natal Moist Grassland in the Sub-Escarpment Grassland Bioregion of the Grassland Biome Unit (Mucina & Rutherford 2006). This area contains the larval food plants *Protea caffra* Meisn. and *P. simplex* E. Phillips (= *P. flanaganii*) (Proteaceae).

**Habits** The species is found among trees of *Protea caffra* Meisn. and *P. simplex* E. Phillips (Proteaceae) on mountain slopes. The eggs are laid singly on *Protea* buds. The larvae burrow into the base of the flower heads where they spend their entire development and also pupate. Small ants attend the larvae and pupae. Adult males are territorial (G.A. Henning & S.F. Henning 1988).

**Flight period** Adults emerge from July to November.

**Early stages** Described by Pennington (1946). Larval food: *Protea simplex* E. Phillips (= *P. flanaganii*) (Proteaceae); noted as *P. flanaganii* Phillips (Proteaceae) by Pennington (1946); *P. caffra* Meisn. (Proteaceae) (Pringle *et al.* 1994).

#### RATIONALE

*Capys penningtoni* is known from fewer than 10 localities in the southern Drakensberg foothills. Habitat change may cause this butterfly species to become more threatened in the near future. No conservation management plan is currently in place. The number of localities where the butterfly is found is diminishing, as are their numbers in some localities. This taxon is very localised, despite the food plants being widespread. It was listed as Rare in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b). This taxon has narrow habitat specificity, a medium-sized geographic range and fairly low abundance.

## THREATS

The major threat is habitat destruction (principally of the *Protea* trees) mainly owing to too frequent fires and possibly the removal of *Protea* trees. The ecosystem status of the habitat, from a vegetation perspective, is Vulnerable (Rouget *et al.* 2004). Unusual weather conditions, such as snow, can be threats to the proteas and consequently to the butterflies. The particular patches inhabited by this species should be monitored and any imminent threats investigated.

## CONSERVATION

The species has been recorded within certain nature reserves on some of the foothills of the KwaZulu-Natal Drakensberg. Considerable further research is needed as to autecological and synecological factors, as well as the range and area of occupancy of this species.

TRIBE Aphnaeini Distant, 1884

GENUS *Chrysoritis* Butler, 1897

A purely Afrotropical genus containing 42 species.

## *Chrysoritis aureus* (Van Son, 1966)

**Type locality** SA: [G]—'Heidelberg (TVL.)'.

**Common name** Golden Opal, Goueopaal (A).

**Status** Vulnerable [VU B1ab(ii,iv)+2ab(ii,iv); D2].

**Distribution** SA: G—near the town of Heidelberg; M—on the farm Malanskraal (east of Heidelberg), as well as near Greylingstad.

## ECOLOGY

**Range & population** The colonies of *Chrysoritis aureus* are fairly small and are restricted to the unique habitats required by the species. The requirements in terms of habitat and other associations indicate the need for a structured and very stable environment. These insular populations have become further isolated by man-made structures such as roads and towns. This may have effectively restricted the gene pools to each individual colony. Bottlenecks during adverse conditions could have further reduced the number of genetic combinations. The colony in the Alice Glockner Nature reserve has several inhabited ant nests while the type colony and the colony in the Suikerbosrand Nature Reserve are fairly small. The colony on the farm Malanskraal is just inside the Mpumalanga provincial boundary and is limited to a south-facing scree of rock just below the highest peak of the range. The other colony at Greylingstad is on the southern slope of the hill below the highest peak.

**Habitat** The habitat is on south-facing, well-drained slopes with shallow humus in the two vegetation types Andesite Mountain Bushveld and Gold Reef Mountain Bushveld belonging to the Central Bushveld Bioregion of the Savanna Biome (Mucina &

Rutherford 2006). It is interesting that the localities near Heidelberg are situated on the quartzites of the Witwatersrand geological system whereas the localities in the Malanskraal and Greylingstad area are on the Ventersdorp lava geological system. A vegetation study at three of the five localities discovered that the floristic composition and the phenotype of the host plant differ between the habitats of the two geological systems (Terblanche *et al.* 2003). The adaptation of rare species to slightly different vegetation habitat conditions at different localities is of importance for insect conservation in the landscape context, especially in the future where anthropogenic impacts may increase (Samways 2005). Though the floristic composition at localities of *Chrysoritis aureus* differ, the habitat structure at the studied localities is similar and a tree stratum is absent. Frost and fire may both therefore be important ecological factors that sustain a suitable habitat for *Chrysoritis aureus* (Terblanche *et al.* 2003; Terblanche 2005).

Colonies occur at altitudes of 1 650 to 1 800 m (Terblanche & Van Hamburg 2003). The Alice Glockner Nature Reserve is situated in the rain shadow of the Suikerbosrand, at more than 1 900 m above sea level (G.A. Henning & Roos 1999, 2000a,b; Roos & G.A. Henning 2000). The localities inhabited by *Chrysoritis aureus* are therefore much drier than others in the vicinity (G.A. Henning & Roos 1999, 2000a,b; Roos & Henning 2000). The curved end of the Ventersdorp granite dome ends just short of the southern and eastern boundaries of the Suikerbosrand Nature Reserve. Abutting this is an area of quartzitic rock raised at the dyke between the two strata and also raised further southeast, on the other side of Heidelberg, forming the mountains on which the Alice Glockner Nature Reserve is situated. Still further to the southeast similar habitats have been formed around Greylingstad in Mpumalanga. These east-west mountains fulfil the habitat requirements of *C. aureus* and its food plant, *Clutia pulchella* L. (Euphorbiaceae). Adjacent mountain ranges with a north-south direction do not meet the climatic and habitat requirements. The area inhabited apparently requires a south-facing slope with very large rocks below a peak that is at an elevation well over 1 700 m. The site should have a comparatively low rainfall and should also be above the *Protea* line (G.A. Henning & Roos 1999, 2000a,b).

**Habits** This species flies swiftly around rocky ridges, settling on the rocks or on small plants growing in the area. They can be found feeding on flowers. The males establish territories around the prominent rocks containing host ant colonies. They select a prominent perch on which to settle, often an old flower stem, from which they chase other males from their territories. When settling on rocks, the butterflies generally choose a fairly large, flat rock and settle in the middle of it, away from the edges, which could conceal predators such as lizards. The major predators observed are robber flies (Asilidae). The butterflies are captured by the robber fly while in flight.

**Flight period** September to April. The species appears to be double-brooded, with an early hatch in September or October and a later, more prolonged emergence from December to April. The peak emergence is in December.

**Early stages** Described by S.F. Henning (1983a), S.F. Henning & G.A. Henning (1989), and G.A. Henning & Roos (1998, 1999, 2000a,b). Larval food: *Clusia pulchella* L. (Euphorbiaceae) (S.F. Henning 1983a). Associated ant: *Crematogaster* species (S.F. Henning 1983a); *C. liengmei* (G.A. Henning 1998; G.A. Henning & Roos 1999, 2000a,b).

### RATIONALE

At present, after decades of attempts to locate further colonies, only five confirmed localities of *Chrysoresis aureus* are known (Terblanche *et al.* 2003). The type locality of this butterfly is conserved as National Heritage Site No. 14 on land belonging to the South African National Defence Force. However, in the absence of any detailed research on the habitat requirements of the butterfly, it has become almost extinct there, having once been numerous, owing to possible overprotection from fire (Terblanche 2005). Most subpopulations of *C. aureus* are encountered within an area of 200 to 400 m<sup>2</sup> (Terblanche & Van Hamburg 2003). Owing to the decline in numbers at the type locality over the last 10 years, and its restricted occurrence in area of occupancy, *C. aureus* is listed as Vulnerable. Previously listed as Rare in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b). This species has very narrow habitat specificity, a medium-sized geographic range and low abundance.

### THREATS

Even though every effort is being made to protect this species in two reserves, the effects of pollution from neighbouring cities could result in detrimental habitat modification. There are also housing developments at the base of the Alice Glockner Nature Reserve that may result in human interference and subsequent damage to the site. The National Heritage Site at the type locality near Heidelberg has been adversely modified by secondary succession owing to lack of burning and encroachment of alien invaders. Efforts are being made to rectify this situation. Anthropogenic influences are a threat at all the sites. It is currently difficult to quantify the effects of gaseous, acid rain or particulate pollution at these sites. Inappropriate fire regimes would also adversely affect the ecology of the Golden Opal as well as its synecological linkages. The ants associated with this taxon are particularly prone to habitat alteration (Terblanche & Van Hamburg 2004). The ecosystem status of the habitats, from a vegetation perspective, varies from Endangered to Vulnerable (Rouget *et al.* 2004).

### CONSERVATION

This butterfly was protected under the Transvaal Ordinance No. 12 of 1983, Schedule 45 (Schedule

7)—protected wild animals. *Chrysoresis aureus* (as *Poecilmitis aureus*) is protected in Appendix 7 of the Ordinance. 'Protected wild animals may not be hunted, kept in captivity, captured, poisoned, sold, bought, imported or exported without a permit from the administrator.' It is currently protected in the Alice Glockner Nature Reserve, the Suikerbosrand Nature Reserve and in National Heritage Site No. 14 at the type locality near Heidelberg (G.A. Henning & Roos 1999, 2000a,b, 2001; Terblanche *et al.* 2003; Terblanche & Van Hamburg 2003). The co-operation between the Lepidopterists' Society of Africa, the government (GDACE), tertiary institutions and the public sector has been most rewarding in the case of the conservation of *Chrysoresis aureus*. A larger-scale vegetation and ant study has been undertaken as part of an ongoing project to deal with future conservation needs.

### *Chrysoresis lyncurium* (Trimen, 1868)

**Type locality** [SA: EC]—'near the River Tsomo'.

**Common name** Tsomo River Opal, Tsomorivier-opaal (A).

**Status** Vulnerable [VU B2ab(iii,iv); D2].

**Distribution** SA: EC, KZN.

### ECOLOGY

**Range & population** This taxon is known only from a few sites in the Eastern Cape and from one colony at Bushmansnek in KwaZulu-Natal. Very few specimens have recently been seen at the small, degraded Tsomo River (Mbulu forest) locality. Further work is needed to validate the taxonomic status of the KwaZulu-Natal insect.

**Habitat** Moist Upland Grassland. Rocky outcrops in Tsomo Grassland and Drakensberg Foothill Moist Grassland of the Sub-Escarpment Grassland Bioregion in the Grassland Biome Unit (Mucina & Rutherford 2006). Inhabits rocky outcrops in high-rainfall montane grasslands. The rocky outcrops contain stunted bushes of *Diospyros* (Ebenaceae) and *Myrsine* (Myrsinaceae), the likely larval host plants.

**Habits** The species flies swiftly around rocky ridges, settling on rocks or on plants. They feed on flowers, usually early in the morning or late in the afternoon. Males show territorial behaviour near the host ant colonies. The associated ant is believed to be a *Crematogaster* species (Heath 1997a).

**Early stages** Nothing published. Larval food: *Myrsine* species (Myrsinaceae); S.F. Henning & G.A. Henning (1989); *Royena* species (note that the genus *Royena*, referred to in the literature, is a synonym of the genera *Diospyros* and *Euclea*, depending on the relevant species—see Germishuizen *et al.* 2006); *Diospyros* species (Ebenaceae) (Owen-Johnston 1991; Heath 1997a). Associated ant: *Crematogaster* species 1 (SAM-HYM C009251 – S.A. Museum) (Heath 1997a).

## RATIONALE

Very few localities are known in an area ranging from Mbulu in the Eastern Cape to Kokstad in southern KwaZulu-Natal. Taxonomic confusion with the closely related *Chrysoritis lycegenes*, which occurs further north, may obscure the true conservation status of *C. lyncurium* in terms of its restricted distribution. The habitats, especially the type locality, are in danger from alien invasive species (Woodhall 1996). Owing to the restricted occurrence in area of occupancy *C. lyncurium* is listed as VU D2. Formerly listed as Rare in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b). This taxon has narrow habitat specificity, a medium-sized geographic range and low abundance.

## THREATS

The locality at Mbulu Forest, which is in all probability the type locality of the species, is under major threat from invasive black wattle, *Acacia mearnsii* De Wild. (Fabaceae). Should it be determined that specimens from KwaZulu-Natal are, in fact, not referable to this species, it would mean that this insect is in imminent danger of extinction. High-intensity grazing also poses a risk. The ecosystem status of the habitats, from a vegetation perspective, varies from Endangered to Vulnerable (Rouget *et al.* 2004).

## CONSERVATION

This species was placed on the list of protected wild animals of the former Cape Province in 1976 (Ordinance 19 of 1974, amendment of Schedule 2 in 1976). The Bushmansnek locality is in the Mzimhdwana Nature Reserve. No conservation measures are in place at the Mbulu forest site. Further searches and study are urgently required. Removal of alien invasive trees, particularly *Acacia mearnsii* De Wild. (Fabaceae), is critical.

## *Chrysoritis dicksoni* (Gabriel, 1947)

**Type locality** [SA: WC]—'Cape Province, near Melkbosch Strand'.

**Common name** Dickson's Strandveld Copper, Dickson-opaal (A).

**Status** Critically Endangered [CR A3ce; B2ab (i,ii,iii,iv,v)].

**Distribution** SA: WC.

## ECOLOGY

**Range & population** Historically, there were two main, disjunct population groups. One group was found between Melkbosstrand and Atlantis (three colonies, now all apparently 'extinct'). Another two colonies were known from near Witsand (east of De Hoop Nature Reserve). Both of these appear to be at least Critically Endangered. The population size seems to fluctuate significantly between years (Heath & Brinkman 1995). No literature appears to exist

for measuring or quantifying the size of colonies of *Chrysoritis* with the aid of sample plots, transects or any well-described mark-release-recapture procedure (Terblanche & Van Hamburg 2004).

**Habitat** Clark & Dickson (1971) described the habitat (north of Cape Town) as country of the sandveld type, with short vegetation. Near Atlantis, the species was found in Atlantis Sand Fynbos (Mucina & Rutherford 2006), in the Malmesbury Centre of Endemism. The habitat north of Witsand is in Albertinia Sand Fynbos (Mucina & Rutherford 2006) in the Potberg Centre of Endemism. The habitats contain considerable amounts of *peperbos*, *Montinia caryophyllacea* Thunb. (Montiniaceae), and *dakriet* (Restionaceae) amongst which the associated ant builds its nests. The degraded site near Atlantis still contains a number of other localised and threatened plant (Hilton-Taylor 1996) and insect (J. Ball, pers. comm.) taxa. The habitat itself is threatened by modification and should enjoy high conservation priority.

**Habits** The adults fly low in open sandy areas, often settling on low vegetation. The butterfly and ant species are particularly sensitive to habitat modification. The colonies near Atlantis would shift in geographic position every few years. With increasing alien vegetation, fires have become too frequent. Adult males seem to be decidedly gregarious and congregate at certain spots in the field (Clark & Dickson 1971). Heath & Brinkman (1995) described aspects of the population dynamics of *Chrysoritis dicksoni* based on collections and observations in the field. They hypothesised that individuals may remain in the larval or pupal state for more than one year.

**Flight period** Late July to the middle of September.

**Early stages** The egg, first instar larva, final instar larva and pupa were described by Clark & Dickson (1971). The second instar larva was described by Heath & Brinkman (1995). Larval food: suspected to be ant larvae (Clark & Dickson 1971) but the larva was observed to be fed by trophallaxis with host ant (Heath & Brinkman 1995). Associated ant: *Crematogaster peringueyi* Emery (Clark & Dickson 1971).

## RATIONALE

Owing to habitat destruction and the lack of a conservation plan in action, the species seems to have disappeared from both its type locality and from nearby localities north of Cape Town (agricultural and urban developments accompanied by the expansion of alien invasive plant species). Too frequent man-made fires at the wrong time of the year are also thought to be destructive (Heath & Brinkman 1995). Only two remaining viable populations are known and *Chrysoritis dicksoni* therefore faces extinction. It is listed here as Critically Endangered. The taxon was listed as Vulnerable in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b), but as Endangered in G.A. Henning & S.F. Henning (1995). This species has very narrow habitat specificity; it

had a fairly large geographic range, which has been severely diminished, and has very low abundance.

### THREATS

Apparently extinct from the colonies near and north of Melkbosch Strand (Pella Mission). The Witsand colony near the mouth of the Breede River has to be investigated further as no specimens have been seen for a few years. This butterfly is currently known from a single subpopulation near Vermaaklikheid. This species is particularly vulnerable to agricultural activity and the encroachment of alien vegetation. Fires at the wrong time of the year are also thought to be a threat, though other unknown factors also appear to have an influence on the adult populations (Heath & Brinkman 1995). The butterfly is in a precarious position as habitat modification is a serious threat. The ecosystem status of the habitats, from a vegetation perspective, varies from Critically Endangered to Endangered (Rouget *et al.* 2004).

### CONSERVATION

This species was placed on the list of protected wild animals of the former Cape Province in 1976 (Ordinance 19 of 1974, amendment of Schedule 2 in 1976). Neither of the extant colonies appear to be part of a conserved area. The ecology, especially the ecosystem requirements of the butterfly, is poorly understood, rendering proper conservation management difficult. No practical conservation measures have been instituted. No action to conserve the habitat (Paapekuil Outspan: Portion 6 No. 1, Crown Grant 127, Registered 16 September 1941), near Atlantis transpired following the very adequate reports motivating this by (i) Cottrell (1978) and (ii) Pool & Haselau (1986). Urgent eradication of alien vegetation with proactive management plans, monitoring and implementation are needed. The habitat near Atlantis, with high endemic assemblage diversity, is a highly threatened site containing numerous other endangered plant and insect taxa (Ball 2006).

## *Chrysochrysis rileyi* (Dickson, 1966)

**Type locality** SA: [WC]—‘Brand Vlei, near Worcester, Cape Province’.

**Common name** Riley’s Opal, Riley-opaal (A).

**Status** Endangered [EN B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)].

**Distribution** SA: WC—known only from the type locality at Brandvlei Dam.

### ECOLOGY

**Range & population** Known only from this single locality near the east side of Brandvlei Dam, southwest of Worcester. The habitat is a few hectares in extent. Probably less than 200 adult individuals occur in a favourable year; the species was last

observed in good numbers in 2005 (J.B. Ball, pers. obs.).

**Habitat** Fairly gentle, west-facing and sparsely vegetated, sandy slopes, at an altitude of about 300 m. The habitat is in Breede Sand Fynbos (Mucina & Rutherford 2006).

**Habits** Adults fly in the dry areas around the Brandvlei Dam among short bushes along the gentle slopes of hills overlooking the dam and are often seen feeding on mesembryanthemum flowers. The butterfly’s flight is fairly energetic.

**Early stages** Nothing published. Larval food: *Aspalathus spinosa* L. (Fabaceae) (S.F. Henning & G.A. Henning 1989); *Thesium* species (Santalaceae) (Heath in Pringle *et al.* 1994); *Aspalathus* species (Fabaceae) (Schlosz in Heath 1997a). Associated ant: *Crematogaster peringueyi* Emery (Heath 1997a).

### RATIONALE

More than 40 years after its description, *Chrysochrysis rileyi* has not been recorded from any other locality, highlighting the importance of adequately conserving the type locality. Habitat change in the near future may cause this butterfly species to become very threatened in a short time. No conservation management practices are currently in place. It was listed as Rare in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b). This taxon has narrow habitat specificity, a small geographic range and low abundance.

### THREATS

Known only from the type locality. Continued urban and agricultural developments in the area constitute major threats. There is also a quarry that has impacted on the habitat. A nearby building development has recently occurred. The ecosystem status of the habitat, from a vegetation perspective, is Endangered (Rouget *et al.* 2004).

### CONSERVATION

No conservation measures are in force. The site has to be assessed and conservation measures have to be put into place.

## *Chrysochrysis thysbe* (Linnaeus, 1764)

**Type locality** [SA: WC]—‘Cap b[ona]e Spei’.

**Distribution** SA: EC and WC.

### ECOLOGY

**Range & population** There are seven subspecies, jointly occurring over much of the southern and western Cape coastal and subcoastal areas, from Port Elizabeth in the Eastern Cape to Namaqualand in the Northern Cape. Three of the subspecies are considered to be threatened.

**Habitat** Inhabits Fynbos on dunes and some distance inland.

**Early stages** Described by Clark & Dickson (1952, 1971); Larval food: *Zygophyllum* species (Zygophyllaceae); *Chrysanthemoides* species (Asteraceae); *Aspalathus* species (Fabaceae); *Lebeckia plukenetiana* E.Mey. (Fabaceae) (Clark & Dickson 1952, 1971); *Thesium* species (Santalaceae) (Heath 1997a); *Osteospermum polygaloides* L. (Asteraceae) (Heath 1997a). Associated ant: *Crematogaster peringueyi* Emery (Clark & Dickson 1971).

### *Chrysoritis thysbe whitei* (Dickson, 1994)

**Type locality** SA: [EC]—near Port Elizabeth.

**Common name** Algoa Opal, Algoa-opaal (A).

**Status** Endangered [EN A3ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)].

**Distribution** SA: EC—known only from the vicinity of Port Elizabeth.

#### ECOLOGY

**Range & population** Historically, the subspecies has been known only from the west side of Port Elizabeth extending to just beyond Schoenmakerskop, 0.5 to 1 km from the sea. The taxon had many very strong colonies of a few hundred specimens annually in the 1960s and 1970s (J.B. Ball, pers. obs.). The colonies in the suburbs of Humewood and Summerstrand have been destroyed by habitat fragmentation due to urbanisation and alien invasive vegetation.

**Habitat** The habitat is Algoa Dune Strandveld, which is an azonal vegetation type (Mucina & Rutherford 2006) less than 1 km from the shoreline, with low scrub and a moderate amount of intervening open sand.

**Habits** Adults fly swiftly between the low shrubs and settle on the vegetation.

**Flight period** October to March.

**Early stages** Nothing published. Food plant: recorded by Clark & Dickson (1971) as an *Aspalathus* species (Fabaceae).

#### RATIONALE

*Chrysoritis thysbe whitei* has been recorded at only five confirmed localities in the vicinity of Port Elizabeth. Two of the five localities have already been lost and two of the remaining three are under severe threat from alien invasive species. *C. thysbe whitei* is listed here as Endangered and will soon be Critically Endangered if no conservation action is taken. Not formerly included in the Red Data Book or Red-Listed. This taxon has fairly narrow habitat specificity, a small geographic range and low abundance.

#### THREATS

The habitats suitable for this subspecies have become drastically reduced by invasive Australian acacias—

mainly the long-leaved wattle, *Acacia longifolia* (Andrews) Willd., and *rooikrans*, *A. cyclops* A.Cunn. ex G.Don (Fabaceae)—as well as by urban expansion. In recent years, its colonies at Summerstrand and Humewood have been eliminated by urban development, leaving only three known localities for the insect. Two of them are now also under threat from the same sources. The presence of *rooikrans* is associated with increased fire frequency and intensity. The ecosystem status of the habitat, from a vegetation perspective, is Endangered (Rouget *et al.* 2004).

#### CONSERVATION

Only the colony at Schoenmakerskop falls within a protected area (the Sardinia Bay Nature Reserve). This is administered by the Nelson Mandela Metropole. Active steps should be taken to monitor population levels, remove alien invasive vegetation regularly and reduce the frequency of fires.

### *Chrysoritis thysbe mithras* (Pringle, 1994)

**Type locality** SA: [WC]—‘Knysna’.

**Common name** Brenton Opal, Brenton-opaal (A).

**Status** Endangered [EN B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)].

**Distribution** SA: WC—Brenton-on-Sea and between Still Bay and Riversdale.

#### ECOLOGY

**Range & population** The total historical range of the butterfly near Brenton-on-Sea was about 6 km<sup>2</sup>. The last known colony occupied an area of < 0.5 km<sup>2</sup>. Less than 50 specimens have been seen there in the last 30 years (Ball, Edge & Pringle, pers. obs.). There is also a small colony on agricultural land between Riversdale and Still Bay.

**Habitat** At Brenton-on-Sea this is disturbed Knysna Sand Fynbos (Mucina *et al.* 2005) on both east- (historically) and southwest-facing slopes at an altitude of 80 to 120 m. The vegetation is fire-dominated asteraceous Fynbos with a high abundance of *Chrysanthemoides monilifera* (L.) Norl. (Asteraceae). The habitat between Riversdale and Still Bay is in Canca Limestone Fynbos (Mucina & Rutherford 2006).

**Habits** Adults fly energetically among open calcareous sandy areas between bushes of the suspected food plant. The ecology is poorly known. Larvae probably feed on *Chrysanthemoides monilifera* (L.) Norl. (Asteraceae). The larval host ant is probably a species of *Crematogaster*.

#### RATIONALE

*Chrysoritis thysbe mithras* has been recorded only at Brenton-on-Sea and at one locality between Still Bay and Riversdale. The Brenton-on-Sea locality appears to have been lost owing to alien invasive plant species (Edge 2005). According to E.L. Pringle (pers. comm.)

the locality between Still Bay and Riversdale appears to support only a weak colony, and too few specimens are available to ascertain whether they are referable to the same subspecies (Edge 2005). The taxon was not listed in S.F. Henning & G.A. Henning (1989), but was included as Rare in G.A. Henning & S.F. Henning (1995). It has narrow habitat specificity, a medium-sized geographic range and low abundance.

### THREATS

This subspecies has already disappeared from some of its former localities. Threats to the remaining localities are habitat destruction and encroachment of alien vegetation. At Brenton-on-Sea, there is severe habitat degradation due to alien vegetation invasion, resulting in shading and fragmentation of the habitat, and to housing development, with loss of connectivity of microhabitats. The invasive alien vegetation consists chiefly of *rooikrans*, *Acacia cyclops* A.Cunn. ex G.Don, and black wattle, *A. mearnsii* De Wild. (Fabaceae). The very small total population size and minute last known area of occupancy (< 0.5 km<sup>2</sup>) make this subspecies exceptionally vulnerable to any changing conditions (if the taxon is still extant there). The fire frequency has been reduced. The weak colony noted between Riversdale and Still Bay is currently not threatened. The ecosystem status of the habitat, from a vegetation perspective, varies from Endangered to Vulnerable (Rouget *et al.* 2004).

### CONSERVATION

No conservation measures are in place. Further searches are required to ascertain whether the taxon is still extant at and around Brenton-on-Sea, as well as between Riversdale, Still Bay and Knysna. It is also unclear whether the insect still occurs in the Mossel Bay area, and, if so, whether individuals from there are referable to the present taxon. Removal of alien invasive plants is needed where this is a problem.

## *Chrysoritis thysbe schloszae* (Dickson, 1994)

**Type locality** SA: [WC]—'Western Cape Province: near Moorreesburg'.

**Common name** Schlosz's Opal, Schlosz-opaal (A).

**Status** Critically Endangered [CR C2a(i)].

**Distribution** SA: WC—near Moorreesburg.

### ECOLOGY

**Range & population** The single, small type locality extends over less than 1 km<sup>2</sup>. It is situated on the southern side of the small mountain known as the Swartberg (not to be confused with the large mountain range to the north of the Little Karoo), south of the town of Koringberg. No specimens of this taxon have been seen either on the hill called Koringberg or on nearby low hills. Fewer than 10 female specimens have ever been seen, and there

are possibly less than 50 adult specimens emerging annually, based on counts during site visits.

**Habitat** Adults are found amongst scrubby, low vegetation containing numerous mesemb or *vygie* plants of the family Aizoaceae. The vegetation type in the isolated remnant of natural vegetation is known as Swartland Shale Renosterveld in the Fynbos Biome Unit (Mucina & Rutherford 2006), previously referred to as West Coast Renosterveld (Newton & Knight 2004). Adults have been observed at altitudes of 350 to 450 m.

**Habits** The males have a short, low, whirling flight, settling on low vegetation or the ground. Very little information is available about the ecology of this butterfly. The taxon is double-brooded, adults being more commonly seen in spring and autumn.

**Flight period** October to March.

**Early stages** Unpublished. Larval food plant: the larvae of this insect do not feed on the food plant of *Chrysoritis thysbe thysbe* as stated in the type description ex Heath.

### RATIONALE

The conservation needs of *Chrysoritis thysbe schloszae* derive from the fact that this taxon is currently represented by a declining population known only from the very small type locality, which has become cut off from remaining potentially suitable habitat (surrounding renosterveld) owing to agricultural activity. No specimens have been found on nearby renosterveld remnants. When discovered in 1989, the population was already small and numbers of adults seen have declined markedly over the last decade. Not previously included in the Red Data Book or Red-Listed.

### THREATS

The isolated renosterveld habitat of *Chrysoritis thysbe schloszae* has been severely impacted by increasing aridification, probably exacerbated by climate warming. Only a small portion of the original extent of renosterveld in the Cape Floral Kingdom remains. The habitat of the type locality is marooned in a sea of wheat farms, isolated by a lack of genetic exchange and impacted by changes in grazing and natural fire. This region has been severely affected by drought over the last decade. The habitat isolation has probably led to genetic isolation, with possible inbreeding depression. Natural fire regimes have been suppressed, leading to an overgrowth of grass (invasive, altered succession) on the higher reaches of the low mountain. Natural grazing has been suppressed over hundreds of years. The influence of pesticides from the surrounding wheat lands is not known. Linkage with the Renosterveld Restoration Project, funded by the Table Mountain Fund of WWF-SA would be useful (Krug 2004). The ecosystem status of the habitat, from a vegetation perspective, is Critically Endangered (Rouget *et al.* 2004).

## CONSERVATION

No conservation measures have been taken to-date. Such measures would require population monitoring, an autecological study to determine the habitat requirements of the species, as well as an appropriate fire regime (which, however, would be difficult to execute as the type locality is surrounded by wheat farms). The habitat is being engulfed by grass. The latter needs investigation and probably fire in late autumn, the cycle yet to be determined. Co-operation with local farmers is needed, coupled with ongoing communication. Monitoring for invasive alien vegetation is needed. A continuing management plan is needed to prevent this taxon from going extinct.

### *Chrysoritis penningtoni* (Riley, 1938)

**Type locality** [SA: EC]—‘Gaika’s Kop, C[ape]P[rovince]’.

**Common name** Pennington’s Opal, Pennington-opaal (A).

**Status** Vulnerable [VU A2c; B2ab(iii); C1].

**Distribution** SA: EC—Gaika’s Kop, Hogsback, Elandsberg and Mount Kubusie.

## ECOLOGY

**Range & population** This taxon is found on four Eastern Cape mountains. The strongest colony of a few hundred adult specimens per year occurs on Gaika’s Kop. This colony is a few acres in size. The Elandsberg and Mount Kubusie localities are not very strong, each being a few acres in size and with less than 100 adults seen annually.

**Habits** The species can be found flying within restricted areas about rocky outcrops sparsely covered with low shrubs.

**Habitat** Rocky slopes and outcrops (below the summits) in Amathole Montane Grassland in the Drakensberg Montane Bioregion of the Grassland Biome Unit (Mucina & Rutherford 2005) at an altitude above 1 500 m.

**Flight period** October to March.

**Early stages** Nothing published. Larval food: nothing published. Associated ant: *Crematogaster* species 8 (SAM-HYM C009253) or species 1 (C009250) (Heath 1997a).

## RATIONALE

*Chrysoritis penningtoni* is known to exist at fewer than 10 localities. Alien invasive species and overprotection from fire seem to have caused a decline in the number of individuals at three localities. Owing to this apparent decline and its restricted occurrence in area of occupancy it is listed as Vulnerable. The species was included as Rare in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b). This taxon has fairly narrow habitat specificity, a medium-sized geographic range and moderate abundance.

## THREATS

The colonies on the Elandsberg and on Mount Kubusie are comparatively small; it would appear that the colony on Mount Kubusie is under threat from increasingly moribund vegetation, resulting from interference by MTO Forestry (previously SAFCOL) in the natural fire regime. The Gaika’s Kop colony is threatened by invasive nassella grass, *Nassella trichotoma* (Nees) Hack. ex Arechav. (previously known as *Stipa trichotoma*) (Poaceae) and those on the Hogsback by encroachment from bramble, a *Rubus* species (Rosaceae). IUCN Criteria A(2), B and C are met. The ecosystem status of the habitats, from a vegetation perspective, is Vulnerable (Rouget *et al.* 2004).

## CONSERVATION

There are currently no conservation measures in force. The land on which the colonies on Hogsback and Mount Kubusie occur belongs to the Department of Water Affairs and Forestry, while that on the Elandsberg belongs to MTO Forestry. The land that supports the colony on Gaika’s Kop is privately owned.

### *Chrysoritis trimeni* (Riley, 1938)

**Type locality** [SA: NC]—‘Port Nolloth, Namaqualand’.

**Common name** Trimen’s Opal, Trimen-opaal (A).

**Status** Vulnerable [VU A3c; D2].

**Distribution** SA: NC—McDougall’s Bay (near Port Nolloth) and Kleinzee.

## ECOLOGY

**Range & population** This butterfly has a known extent of occurrence of about 70 km<sup>2</sup> between Kleinzee and McDougall’s Bay, just south of Port Nolloth in the Northern Cape. The area of occupancy is considerably smaller than the extent of occurrence. At present the insect is known only from the extremes of its range. The population has not been quantified. In the known localities, the populations seem small in comparison to other populations of *Chrysoritis* along the west coast.

**Habitat** Adults are found in the vegetated coastal sand dunes above the high-water mark. The vegetation type of the habitat has been classified as Richtersveld Coastal Duneveld (in the northern part of its distribution) and Namaqualand Coastal Duneveld (in the south) in the Namaqualand Sandveld Bioregion of the Succulent Karoo Biome (Mucina & Rutherford 2006). Considerable further study is needed to determine the habitat requirements of this species (W.H. Henning 1977).

**Habits** Adults fly close to the ground, particularly in depressions among the sand dunes. This is necessary as there are often strong prevailing winds. The flight period is from August to March.

**Flight period** August to March with a peak in November.

**Early stages** The host plant of the larva is a *Zygophyllum* species (Zygophyllaceae). The ant associated with the early stages of the life cycle is a *Crematogaster* species (S.F. Henning & G.A. Henning 1989).

#### RATIONALE

*Chrysothrix trimeni* has been recorded from only two localities, Kleinsee and McDougall's Bay near Port Nolloth. More localities may be discovered in the area between these small towns, but the species appears to be very localised and to date has not been found in any of the other areas regularly frequented by lepidopterists in Namaqualand. It occurs only on the dunes near the coast and appears to be absent inland. There is a threat of future mining activities at the sand dunes in the area between Port Nolloth and Kleinsee. There is a declining population trend in the northern part of its range. The southern portion is situated in a restricted diamond mining area (and not subject to environmental scrutiny). This taxon was listed as Indeterminate in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b).

#### THREATS

The major threat is habitat destruction mainly caused by holiday housing and recreational activities in the north of the range and by strip mining of the coastal dunes for diamonds and heavy metals. The ecosystem status of the habitat, from a vegetation perspective, is Least Threatened (Rouget *et al.* 2004).

#### CONSERVATION

No conservation measures are in force. An environmental plan with biodiversity protection and ongoing monitoring is needed.

GENUS *Trimenia* Tite & Dickson, 1973

A southern African genus containing five species.

### *Trimenia malagrida* (Wallengren, 1857)

**Type locality** [SA]—'Caffraria' [false locality].

**Distribution** SA: WC.

#### ECOLOGY

**Range & population** There are four subspecies in the Western Cape, two of which are considered threatened.

**Habitat** Mountain Fynbos, on dry slopes with short vegetation.

**Early stages** Clark & Dickson (1956, 1971) (*Trimenia malagrida malagrida*); Heath & Brinkman (1996) (*T. malagrida maryae*). Larval food: nothing published. Associated ant: *Anoplolepis custodiens* Smith (Heath & Brinkman 1995) (*T. malagrida maryae*).

#### RATIONALE

In terms of extent of occurrence, *Trimenia malagrida* is confined to the southwestern tip of Africa. However, in terms of area of occupancy, the subpopulations that belong to the four very localised recognised subspecies are restricted to a very few selected patches in the southwestern Cape. *T. malagrida malagrida* is known only from the Cape Peninsula; *T. malagrida paarlensis* only occurs at Paarl Mountain and the Paardeberg; *T. malagrida maryae* has been recorded only from the Bredasdorp and De Hoop districts, while populations of the subspecies *T. malagrida cedrusmontana* are found in the Cederberg Wilderness Area. The latter two subspecies seem to have escaped serious degradation and habitat destruction, since their habitats are remote and more inaccessible to humans.

### *Trimenia malagrida malagrida* (Wallengren, 1857)

**Type locality** [SA]—'Caffraria' [a false locality; previously (mid- to late 1800s), Kaffraria was the part of the Eastern Cape between the Keiskamma and the Kei Rivers (Du Toit 1972)].

**Common name** Scarce Mountain Copper, Leeukopkoperverkie (A).

**Status** Critically Endangered [CR A4ce; 2ab(i,ii,iii,iv,v); D].

**Distribution** SA: WC—Cape Peninsula.

#### ECOLOGY

**Range & population** The last known colony of this taxon occurred in an area the size of one to two tennis courts. Between 20 and 50 adults were observed per season in the late 1980s (J.B. Ball, pers. obs.).

**Habitat** Peninsula Granite Fynbos in the Fynbos Biome Unit (Mucina *et al.* 2005), at altitudes of 250 to 350 m.

**Habits** The adults needed fairly open rocky ground with appropriate vegetation, where they exhibited short, jerky flying sorties, settling on the ground, rocks, grasses or other vegetation. The vegetation included nectaring sources, such as pink-flowered *Mesembryanthemum* species (*sensu lato*) (Aizoaceae) and *Cuscuta* species (Convolvulaceae).

**Flight period** Late January to March.

**Early stages** The first instar larvae of this butterfly taxon have not been found to feed on plant material. It is possible that their larvae are exclusively aphytophagous. No late instar larvae or pupae have been found. One of the other subspecies, *Trimenia malagrida maryae* (Dickson & W.H. Henning 1980), has been noted to have late instar larvae and pupae in the nests of the Pugnacious Ant, *Anoplolepis custodiens* (F. Smith) (Heath & Brinkman 1995). The larval diet has, however, not been ascertained.

## RATIONALE

Of major concern is the decline of the subspecies *Trimenia malagrida malagrida*. Colonies of the nominate subspecies were once known from various localities on the Table Mountain Range, but today only one or two small areas where it may still exist are known (Claassens 2000). Extent of occurrence of *T. malagrida malagrida* is less than 100 km<sup>2</sup>. Area of occupancy is very small and is less than 10 km<sup>2</sup>. Severe fragmentation of its habitat has occurred, leading to an extensive population decline over past decades. This subspecies has not been seen at its last known locality on the western side of Lion's Head since the mid-1990s. The taxon is possibly 'extinct' in the sense that no specimens have been seen in its former localities for some years, but it is not Extinct from the 2001 IUCN Red List categorisation viewpoint. This butterfly was listed as Vulnerable in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b). It was subsequently listed as Endangered in the updated G.A. Henning & S.F. Henning (1995). It has very narrow habitat specificity, a small geographic range and very low abundance.

## THREATS

The nominate subspecies has disappeared from most of its habitats and now appears to be in a precarious state, if not already extinct. It is believed that repeated mountain fires may eventually have taken their toll on the very small only known colony through occurring too frequently during the main part of the butterfly's late summer flight period (S.F. Henning & G.A. Henning 1989; Claassens 2000). It has possibly also been affected by habitat modification due to the invasion of alien vegetation (S.F. Henning & G.A. Henning 1989). The last known colony on the western side of the higher slopes of Lion's Head in Cape Town was destroyed by the too frequent passage of alien vegetation-enhanced fires in the mid-1990s. Ironically, this coincided with a decision made at about the same time by Alderman Kreiner, Chairman of the Amenities and Health Committee of the Cape Town City Council, to halt fire breaks and the burning of fynbos on Table Mountain and elsewhere in the Cape Peninsula (A. Brinkman, pers. comm. 2004). This was partly influenced by the threat of legal claims from residents at the fynbos/suburban interface on the Atlantic border from Camps Bay to Sea Point consequent on smoke/ash pollution caused by controlled vegetation burns. One of the uncontrolled fires in the mid-1990s, near Kloof Nek, was caused by electric cables, with the resultant fire intensified by the biomass of alien vegetation. The imagines used to fly from late January to early April, months when the vegetation is at its driest. The second last known colony of this taxon, near the Apostle Batteries above Llandudno, was destroyed by invasive alien vegetation—groves of trees of a *Eucalyptus* species (Myrtaceae). These groves continue to expand, displacing indigenous vegetation and thus inhibiting invertebrate presence, and also posing a fire hazard. The ecosystem status of the habitat, from a vegetation perspective, is Endangered (Rouget *et al.* 2004).

## CONSERVATION

*Trimenia malagrida malagrida* was placed on the list of protected wild animals of the former Cape Province in 1976 (Ordinance 19 of 1974, amendment of Schedule 2 in 1976), and is also protected in the Table Mountain Nature Reserve. The appearance of the butterfly species on a list of protected animals did not prevent the decline of many of its subpopulations. Butterfly species such as *T. malagrida* will be safe in the long term only if habitat management plans are continuously updated through research and applied. However, no practical measures or monitoring were undertaken after the passing of legislation in 1974. The last known locality is currently in the Table Mountain National Park.

## *Trimenia malagrida paarlensis* (Dickson, 1967)

**Type locality** SA: [WC]—'Cape Province: Paarl Mountain'.

**Common name** Paarl Scarce Mountain Copper, Paarl-kopervlerkie (A).

**Status** Endangered [EN B2ab(i,ii,iii,iv,v)].

**Distribution** SA: WC—Paarl Mountain and Paardeberg.

## ECOLOGY

**Range & population** There are two small Paardeberg localities (each currently about 1 acre in size), about 1 km apart. Probably less than 150 adults emerge every season, based on observations over the past decade. This taxon is probably extinct on Paarl Mountain owing to severe invasion of alien vegetation and too frequent fires in summer/autumn. Even though the taxon on the Paardeberg (about 20 km northwest of Paarl) is very close to *Trimenia malagrida paarlensis* it is, strictly speaking, not referable to *T. malagrida paarlensis*, but is a closely related, isolated population.

**Habitat** Paarl Mountain (as well as the Paardeberg) contains an island of the vegetation type Boland Granite Fynbos (Mucina *et al.* 2005). The fynbos vegetation at the habitats on the Paardeberg has considerable species diversity. Floristic elements include *Aspalathus* species (Fabaceae), peperbos, *Montinia caryophyllacea* Thunb. (Montiniaceae), *Pelargonium* species (Geraniaceae), various grasses (Poaceae), restios (Restionaceae), numerous geophytes (mainly Iridaceae), *Mesembryanthemum* species (Aizoaceae), which are often used as nectaring flowers, as well as numerous proteoid species (Rourke 1980; Vogts 1989; Rebelo 1995), including *Protea repens* (L.) L., *P. laurifolia* Thunb., *P. scorzonrifolia* (Salisb. ex Knight) Rycroft, *P. acaulos* (L.) Reichard, *Leucadendron rubrum* Burm.f., and *L. salicifolium* (Salisb.) I. Williams (Proteaceae). On the Paardeberg, the butterfly occurs high up, near some rocky outcrops, where there is some open ground (rather overgrown at the larger western site—16/12/2004, J. Ball, pers. obs.).

**Habits** Adults have been noted from December to March. February and March showed peak emergence, a time when the fire hazard is also significant. Swanepoel (1953) noted females on Paarl Mountain laying eggs on an *Aspalathus* species (Fabaceae). However, the larvae were not seen feeding on any vegetative material. The larvae are probably aphytophagous with an intimate ant association, as has been noted in another subspecies, *Trimenia malagrida maryae* (Heath & Brinkman 1996).

#### RATIONALE

The area of occupancy of *Trimenia malagrida paarlensis* comprises fewer than five known localities. A significant decline in subpopulations has occurred over the past few decades. This taxon was listed as Rare in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b). It has a narrow habitat specificity, a small geographic range, low abundance and a declining population trend.

#### THREATS

Invasive alien vegetation, mainly Port Jackson willow, *Acacia saligna* (Labill.) H.L.Wendl. (Fabaceae), on the Paardeberg and a *Pinus* species (Pinaceae) and Port Jackson willow on Paarl Mountain, probably poses the most severe threat to this taxon. Inappropriate fire regimes have also proved harmful. At present, the western Paardeberg locality is very overgrown (natural vegetation) and would probably benefit from a local burn. The smaller eastern locality is currently not overgrown. There is a 4x4 trail on the Paardeberg Mountain, but its location does not appear to be impacting negatively on either colony. However, this also has to be further assessed and monitored. The ecosystem status of the habitat, from a vegetation perspective, is Critically Endangered (Rouget *et al.* 2004).

#### CONSERVATION

The colony on Paarl Mountain, probably now extirpated, was situated in the Paarl Mountain Nature Reserve, which was a 'reserve' in name only. No conservation management appropriate to the needs of this butterfly was timeously instituted or maintained. However, the eastern Paardeberg locality is in a nature conservancy (formed by a group of local farmers). The two small habitats currently have no significant invasion of alien vegetation but there is very significant, dense alien vegetation in a ring (containing some very degraded Renosterveld) around the lower portions of the mountain. This will continue to pose an ever-increasing fire risk with the accumulation of combustible material. An appropriate regime of mosaic burning therefore has to be instituted at and around this locality. Detailed autecological and synecological data for *Trimenia malagrida paarlensis*, as well as ongoing monitoring, are urgently needed.

### *Trimenia wallengrenii* (Trimen, 1887)

**Type locality** [SA]—'Swellendam and Grahamstown, Cape Colony' [false localities].

**Distribution** SA: WC.

#### ECOLOGY

**Range & population** There are two subspecies, both of which are considered threatened. The nominate subspecies was rediscovered by C.G.C. Dickson at Mamre, about 50 km north of Cape Town, on 5 November 1936, the published type localities apparently being erroneous.

**Habitat** It inhabits stony and bush-covered hills. *Trimenia wallengrenii gonnemoui* is found on open, stony ground on the plateau and upper slopes of the Piketberg, at an altitude of 650 to 750 m. The respective vegetation types are Sand Plain Fynbos for *T. wallengrenii wallengrenii* and Mountain Fynbos for *T. wallengrenii gonnemoui*.

**Early stages** Described by Clark & Dickson (1971) (in part). Larval food: nothing published. Associated ant: nothing published.

#### RATIONALE

Currently, the nominate subspecies is known only from two very small localities. Most of the other localities known in the past have been destroyed by agriculture and invasive alien vegetation. This taxon was listed as Vulnerable in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b). It has narrow habitat specificity, its geographic range is currently small (formerly medium-sized), and it has low abundance. There has been a sharply declining population trend over the past 20 years. The darker isolated race *Trimenia wallengrenii gonnemoui*, from the Piketberg, is also Red-Listed. It is advisable, as in the case of *T. malagrida*, that the two subspecies should be prioritised for conservation separately. The nominate subspecies, *T. wallengrenii wallengrenii*, seems to be in greatest danger, especially if the habitats near Darling become smaller and more fragmented owing to agricultural expansion.

### *Trimenia wallengrenii wallengrenii* (Trimen, 1887)

**Type locality** [SA]—'Swellendam and Grahamstown, Cape Colony' [false localities].

**Common name** Wallengren's Silver-spotted Copper, Wallengren-silverkolkopervlerkie (A).

**Status** Critically Endangered [CR A3ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)].

**Distribution** SA: WC—endemic to the southwestern Cape, northeast of Cape Town.

#### ECOLOGY

**Range & population** The last two remaining localities, in the Kapokberg and Contreberg, are

about 700 m<sup>2</sup> in extent each. The Kapokberg locality has had very few specimens in the last 10 years (probably no more than 50 adults per flying season). The Contreberg site has shown greater fluctuations in population numbers. There were about 100 adults at the latter locality in November 2003 (J. Ball, pers. obs.).

**Habitat** Currently occurs in Swartland Granite Renosterveld in the Fynbos Biome Unit (Mucina *et al.* 2005), also described as Rocky West Coast Renosterveld (Newton & Knight 2004). Renosterveld itself is threatened (Cowling & Richardson 1995). In the past, the butterfly was also found in the ecotone between renosterveld and Sand Plain Fynbos. Wheat farming has destroyed some of the localities at lower altitudes. The remaining two localities are on the southwestern side of the Kapokberg (south of Darling), and the Contreberg (southeast of Darling). No adults have been observed at the locality north of Mamre for nearly 15 years (J. Ball, pers. obs.).

**Habits** No life cycle information has been published. The larvae are probably aphytophagous, with an obligate ant association. Adult butterflies were noted to fly low and fast, in open areas. Autecological and synecological information is needed.

#### RATIONALE

The extent of occurrence of *Trimenia wallengrenii wallengrenii* is less than 100 km<sup>2</sup>. The area of occupancy is very small and is less than 10 km<sup>2</sup>. Severe fragmentation of its habitat near Darling in the near future is very likely if no conservation action is taken. Lack of dispersal routes and corridors may become a major concern for the long-term survival of the butterfly. It was included as Rare in S.F. Henning & G.A. Henning (1989).

#### THREATS

The subspecies is threatened by habitat destruction and degradation by agricultural activity and invasive alien vegetation. Fires, when the adult butterflies are on the wing, can also be devastating. The ecosystem status of the habitat, from a vegetation perspective, is Critically Endangered (Rouget *et al.* 2004). Trimen reported that he 'found *Trimenia wallengrenii*, rather numerously, on hills near Stellenbosch.' There have been no other records from this locality and it probably no longer occurs there. Extensive agricultural activities in the area have led to the extinction of several colonies. It has survived at a few habitats situated on rough or rocky ground, which, owing to its nature, has escaped the plough. In some cases the cultivated areas extend up to the borders of the existing colonies.

#### CONSERVATION

The last two known localities are on privately owned farms near Darling in the Western Cape. Although the taxon was placed on the list of protected wild animals of the Cape Province in 1976 (Ordinance 19 of

1974, amendment of Schedule 2 in 1976), no practical measures or monitoring have been undertaken, and *Trimenia wallengrenii wallengrenii* appears to be on the brink of extinction.

### *Trimenia wallengrenii gonnemoui* Ball, 1994

**Type locality** SA: [WC]—'Piketberg, 32°53' S.; 18°44' E., Cape Province'.

**Common name** Piketberg Silver-spotted Copper, Piketberg-silwerkolkopervlerkie (A).

**Status** Vulnerable [VU B2ab(iii); D2].

**Distribution** SA: WC—Piketberg.

#### ECOLOGY

**Range & population** This univoltine butterfly has an extent of occurrence of about 10 km<sup>2</sup>. The area of occupancy is about a quarter of that area. The population is currently stable and a great many specimens are observed to emerge annually. This large population has to be accurately quantified.

**Habitat** This subspecies is known only from the southeastern side of the Piketberg in the Western Cape. There are a few metapopulations in Piketberg Sandstone Fynbos (Mucina *et al.* 2005). The butterfly is found on open stony ground at an altitude of 650 to 750 m. This vegetation type is fire-dominated.

**Habits** Adults of this narrow habitat specialist have a short, rapid and jerky flight among low and open vegetation. Males establish territories. The butterfly is univoltine (Ball 1994d). The life cycle has not been studied, and an autecological study is required. The larvae are probably aphytophagous.

#### RATIONALE

This taxon has not previously been included in a Red Data Book or Red-Listed. There are only a few apparently stable metapopulations (fewer than five known) of this butterfly on the Piketberg.

#### THREATS

There are no major known threats at present. However, there are some commercial plantations of a *Pinus* species (Pinaceae) fairly close to the northern side of the largest metapopulation of this butterfly. The inappropriate siting of plantations could rapidly eliminate this insect, and invasive vegetation and inappropriate fire frequency regimes could impact negatively on its ecology. Climate warming, coupled with a 'necklace' of invasive alien vegetation around the base of this mountain (as well as many others in the Western Cape), will probably have ever-increasing detrimental consequences for montane fynbos biodiversity. The ecosystem status of the habitat, from a vegetation perspective, is Endangered (Rouget *et al.* 2004).

**CONSERVATION**

No conservation measures have been implemented. A management plan including biodiversity protection for the area is needed. Extension of commercial afforestation or the commercial cultivation of rooibos tea into the habitat of this butterfly would probably have disastrous consequences. Invasive alien vegetation has to be removed from around the base of the mountain. Vigilance and monitoring are needed.

**GENUS *Aloeides* Hübner, 1819**

A purely Afrotropical genus containing 57 species.

***Aloeides trimeni* Tite & Dickson, 1973**

**Type locality** SA: [G]—‘Transvaal: Witpoortjie’.

**Common name** Trimen’s Copper, Trimen-kopervlerkie (A).

**Distribution** Zimbabwe; Botswana; SA; L.

**ECOLOGY**

**Habitat** Grassland, from sea level to 1 600 m.

**Flight period** September to April.

**Early stages** Described by Clark & Dickson (1971: plate 107); Tite & Dickson (1973); S.F. Henning (1984a); S.F. Henning & G.A. Henning (1989). Larval food: *Aspalathus* species (Fabaceae) (Clark & Dickson 1971). *Hermannia depressa* N.E.Br. (Sterculiaceae) (Pringle *et al.* 1994). Associated ant: unidentified.

***Aloeides trimeni southeyae* Tite & Dickson, 1973**

**Type locality** SA: [WC]—‘Mossel Bay, Cape Province’.

**Common name** Southey’s Copper, Southey-kopervlerkie (A).

**Status** Vulnerable [VU A3ce; B1ab(iii)+2ab(iii)]

**Distribution** SA: WC—from Gouritz River bridge to near Hartenbos.

**RATIONALE**

There are currently only four small known localities of this taxon. It has a declining population trend coupled with a shrinking area of occupancy, based on observations over the last decade. The nominotypical, and more orange-coloured, subspecies is widespread, from the coastal region of the Eastern Cape (Port Elizabeth and Coega) through the Free State to Gauteng and Mpumalanga and is not threatened. In the case of subspecies *southeyae* urban sprawl and industrial development is extending towards three of the four known localities. *Aloeides trimeni southeyae* may soon become endangered if no proactive conservation action is taken. This subspecies was listed as Rare in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b).

**Range & population** This insect has a fairly narrow subcoastal range, from some low hills east of the Gouritz River bridge to near Hartenbos, in the southeastern portion of the Western Cape. The extent of occurrence is about 100 km<sup>2</sup>, although the area of occupancy is much smaller. The total population has not been quantified, but there are probably less than 1 000 adult specimens annually (J. Ball, pers. obs.). Efforts should be made to find other colonies.

**Habitat** The four very small localities are found in North Langeberg Sandstone Fynbos in the Fynbos Biome Unit (Mucina & Rutherford 2006). The habitats are among low shrubby hills or rocky depressions.

**Habits** The life history is not known. An autecological study is needed. Population levels and trends have to be quantified. Adult males establish territories on open stony ground. The flight period is from September to March.

**THREATS**

Urban and industrial development is the present major threat, although agricultural activity could become a threat in future. It is not known whether airborne pollution from the Mossgas petrochemical plant has had an impact. The ecosystem status of the habitat, from a vegetation perspective, is Endangered (Rouget *et al.* 2004).

**CONSERVATION**

No conservation measures have been formulated or implemented. An environmental plan, with biodiversity protection of the resources and habitat needed by the butterfly, presumed associated ant, and food plant, is needed. Implementation and ongoing monitoring are required.

***Aloeides barbarae* S.F. Henning & G.A. Henning, 1994**

**Type locality** SA: [M]—‘Barberton, Transvaal’.

**Common name** Barbara’s Copper, Barbara-kopervlerkie (A).

**Status** Endangered [EN A3ce; B1ab(ii,iii)+2ab(ii,iii)].

**Distribution** SA: M—known only from the type locality at Barberton.

**ECOLOGY**

**Range & population** Has been found in a few restricted colonies near the road past Eureka City, above the Sheba Mine near Barberton. This area appears to have unique links with the high-altitude habitats of the eastern Zimbabwean highlands. The population is estimated at less than 400 individuals (G.A. Henning & Roos 2000a,b).

**Habitat** Grassy hilltops, sparsely strewn with small rocks, in remnant Barberton Montane Grassland in the Mesic Highveld Bioregion of the Grassland Biome Unit (Mucina *et al.* 2005). The locality has a

fairly high rainfall, frost is absent and the grassland is early succession fire climax. Sour Lowveld Bushveld surrounds the grassy peaks.

**Habits** No life cycle information has been published. Male butterflies establish territories on open patches of ground between low vegetation (S.F. Henning & G.A. Henning 1994).

**Flight period** October to December.

**Early stages** Unknown.

#### RATIONALE

This species is known only in fairly small numbers from one population at the type locality. It was not included in S.F. Henning & G.A. Henning (1989), but it was added as Rare to G.A. Henning & S.F. Henning (1995). The species has narrow habitat specificity, a declining population trend, a small geographic range and fairly low abundance. *Aloeides barbarae* is localised and its extent of occurrence appears to be less than 50 km<sup>2</sup>. Its area of occupancy is restricted and constitutes an area smaller than 5 km<sup>2</sup>. The prospect of mining in the area and the presence of plantations of alien *Eucalyptus* trees in the vicinity of the habitats are threats to the continued existence of the butterfly in the area. No conservation action plan is in place.

#### THREATS

Even though the colony is in the Mountainlands Nature Reserve, it is still under threat from habitat modification owing to the effects of grazing by animals not formerly there, road works and even visitors to the reserve trampling the locality. Mining is still a very real threat and there are plans to mine in the nature reserve, near the butterfly localities. The ecosystem status of the habitat, from a vegetation perspective, is Vulnerable (Rouget *et al.* 2004).

#### CONSERVATION

Further autecological and synecological study is needed. The presumed myrmecophilous association of the larvae has to be investigated.

### *Aloeides stevensoni* Tite & Dickson, 1973

**Type locality** [Zimbabwe]: 'Rhodesia: Rusape' [false locality]. Type locality determined by G.A. Henning in Pringle *et al.* (1994) as Haenertsburg in the Limpopo Province of South Africa.

**Common name** Stevenson's Copper, Stevenson-kopervlerkie (A).

**Status** Vulnerable [VU D2].

**Distribution** SA: LP—Wolkberg, one locality in the Wolkberg Mountains and another near Haenertsburg.

#### ECOLOGY

**Range & population** Each population occupies about 0.5 ha. The population numbers have been recorded as high.

**Habitat** Found on south-facing, high-altitude grassy slopes of the Wolkberg. The vegetation type of the habitat is Woodbush Granite Grassland in the Mesic Highveld Grassland Bioregion of the Grassland Biome Unit (Mucina & Rutherford 2006). These granitic soils tend to be deeper and are sought after for commercial afforestation and the growing of crops. The grasslands in the area are rich in endangered/rare flora and fauna (Van Wyk & Smith 2001) but have undergone considerable habitat degradation.

**Habits** No life cycle information has been published. The adults fly in open areas in high-altitude grassland, frequently settling on the ground.

#### RATIONALE

Known only from two localities (one on a private farm near Haenertsburg) on the Wolkberg in Limpopo Province. The taxon has not been included in a Red Data Book or Red-Listed before. It has narrow habitat specificity, a fairly small geographic range and moderate abundance. The overall area of occupancy is small, substantially less than 5 km<sup>2</sup>. Habitat destruction or modification is likely to occur in the near future owing to fire or agriculture (plantations). Neither locality falls within a conservation area at present. No habitat management plan is in place to manage ecological processes that create a suitable habitat.

#### THREATS

Future inappropriate agricultural activity or afforestation could destroy either locality. Both localities need an appropriate fire regime that is suitable for the ecology of the taxon and its (presumed) associated ant species. Frequent fires are also necessary for the maintenance of grassland structure and phytodiversity (Van Wyk & Smith 2001). The locality near Haenertsburg currently has a very ecologically aware owner. Closer to Haenertsburg, there has been considerable habitat degradation from plantation forestry and invasive alien vegetation, including the North American bramble, *Rubus cuneifolius* Pursh (Rosaceae). This has to be guarded against. The ecosystem status of the habitat, from a vegetation perspective, is Endangered (Rouget *et al.* 2004).

#### CONSERVATION

No conservation measures are in place. Neither locality is in a reserve. An environmental management plan, including biodiversity protection and ensuring low-impact agricultural activity, is needed.

### *Aloeides thyra* (Linnaeus, 1764)

**Type locality** [SA: WC]—'Cap. b[ona]e Spei'.

**Common name** Red copper, Rooi-kopervlerkie (A).

**Distribution** SA: WC.

**ECOLOGY**

**Range & population** The nominate subspecies is widespread through the Western Cape. The other subspecies is regarded as threatened.

**Habitat** Occurs in a variety of habitats, including coastal and montane Fynbos and Karoo.

**Habits** Males have a fast and erratic flight, while females fly more slowly, both sexes settling on the ground or on low bushes. Males will establish territories on a bare patch of ground on the tops of small hills.

**Flight period** July to April.

**Early stages** Trimen & Bowker (1887, Vol. 2: 168, 197); Clark & Dickson (1952: 22); Claassens & Dickson (1974: 253, 1977, 1980). Larval food: *Aspalathus acuminata* Lam. subsp. *pungens* (Thunb.) R.Dahlgren; *A. cymbiformis* DC.; *A. laricifolia* P.J.Bergius (Fabaceae) (Pringle *et al.* 1994: 183). Associated ant: *Lepisiota capensis* (Mayr.) (Claassens & Dickson 1974: 253; as *Acantholepis capensis*).

***Aloeides thyra orientis* Pringle, 1994**

**Type locality** SA: [WC]—‘Knysna’.

**Common name** Brenton Copper, Brenton-kopervlerkie (A).

**Status** Endangered [EN B2ab(i,ii,iii,iv,v); C2a(i)].

**Distribution** SA: WC—Knysna, Brenton-on-Sea, Still Bay.

**ECOLOGY**

**Range & population** The extent of known occurrence is fairly large as it is known from a few declining metapopulations above Brenton-on-Sea, west of Knysna and then disjunctively near Still Bay, and between Still Bay and Riversdale (Edge 2005). The extent of occurrence is approximately 500 km<sup>2</sup>. The area of known occupancy is, however, smaller than 10 km<sup>2</sup>. The populations are small. No quantitative methods to assess population sizes or trends have been utilised.

**Habitat** The butterfly is found in Knysna Sand Fynbos in the Fynbos Biome Unit (Mucina & Rutherford 2006). The vegetation type at Brenton-on-Sea is disturbed fire-dominated asteraceous coastal fynbos, where the butterfly is found on flat sandy ground at an altitude of 40 to 240 m (Edge 2005). One of the localities at Still Bay is in the Pauline Bohnen Nature Reserve. A further locality is found on agricultural land between Riversdale and Still Bay (Edge 2005).

**Habits** No information on the life cycle has been published. Males establish small territories that they defend from rivals. The unstable nature of the fire-dominated successional vegetation, coupled with a presumed larval ant association, predisposes towards source and sink metapopulation structure.

**RATIONALE**

The distribution of *Aloeides thyra orientis* is very patchy, and is becoming increasingly fragmented owing to development and the extensive occurrence of alien invasive species along the coast. The coastal areas of South Africa are under enormous pressure from development at present and it is believed that a number of habitats may have been lost owing to development in the past. The area of occupancy of *A. thyra orientis* at any locality is normally very small. This butterfly subspecies has fewer than 10 small colonies left. There has been a severely declining population trend over the past 20 years, particularly in the eastern portion of its range. One colony near Still Bay is stable. Nominotypical *A. thyra* is common and widespread from the Cederberg to Cape Agulhas in the Western Cape, both along the coast as well as inland and in the mountains.

**THREATS**

Invasive alien vegetation coupled with the erection of houses and the construction of roads has severely reduced the area of occupancy of this butterfly at Brenton-on-Sea over the last 15 years (J. Ball, pers. obs.). Diminished or suppressed fire frequency near residential property will probably also be damaging to the ecological requirements of both the butterfly and its presumed larval associated ant. The ecosystem status of the habitat, from a vegetation perspective, is Vulnerable (Rouget *et al.* 2004).

**CONSERVATION**

The colony in the Pauline Bohnen Nature Reserve at Still Bay is stable and secure at present. The colonies at Brenton-on-Sea are located on land zoned for agriculture—the draft Spatial Development Framework (SDF) for the Knysna region designates this area for agriculture and conservation (Edge 2005). A management plan based on good ecological principles and sound observations is needed. The plan has to be implemented and ongoing monitoring instituted. Potential threats have to be identified early. Searching for further localities between the extremes of the known range should be pursued.

***Aloeides carolynnae* Dickson, 1983**

**Type locality** SA: [WC]—‘South Western Cape Province: near Goudini’.

**Distribution** SA: WC.

**ECOLOGY**

**Range & population** The nominate subspecies is found in rough, mountainous terrain in typical fynbos. Subspecies *aurata* occurs in flat, sandy terrain. There are two subspecies, both of which are threatened.

**RATIONALE**

*Aloeides carolynnae* is a rare species of which two localised subspecies have been described. The type locality of *A. carolynnae carolynnae* at Slanghoek

was destroyed for agricultural purposes while the remaining colonies have become more fragmented owing to agriculture and alien invasive plant species. The other subspecies, *A. carolynnae aurata*, appears to be under no immediate threat, but few colonies are known.

### *Aloeides carolynnae carolynnae* Dickson, 1983

**Type locality** SA: [WC]—‘South Western Cape Province: near Goudini’.

**Common name** Carolynn’s Copper, Carolynn-kopervlerkie (A).

**Status** Endangered [EN A3ce; B2ab(i,ii,iii,iv,v)].

**Distribution** SA: WC—Slanghoekberge and the Badsberg.

#### ECOLOGY

**Range & population** The currently known area of occupancy is about 0.5 km<sup>2</sup> of very degraded montane fynbos on the southwestern side of the Badsberg, northwest of Rawsonville. The previous range was about 10 km<sup>2</sup>, but the species has not been seen at some of its former localities for 20 years.

**Habitat** The vegetation type is Hawequas Sandstone Fynbos (Mucina & Rutherford 2006) on the lower slopes of the Badsberg. The elevation of the habitat is between 300 and 600 m.

**Habits** Little is known. The larval food plant is probably an *Aspalathus* species (Fabaceae). The associated ant is not known. The adult has a short and rapid flight, before settling on vegetation, open ground or rocks.

#### RATIONALE

This taxon is currently known from only one small and very degraded locality. There are probably less than 300 adults emerging each season. Less than 50 individuals were seen in 2004 (J. Ball, pers. obs.). This species was listed as Rare in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b). It has narrow habitat specificity, a small and shrinking geographic range and low abundance.

#### THREATS

Expanding viticulture destroyed the bulk of the type locality. Invasive alien vegetation—mainly the silky hakea, *Hakea sericea* Schrad. & J.C.Wendl. (Proteaceae), but to a lesser extent a *Pinus* species (Pinaceae)—has affected the rest of the type locality. Further habitat destruction for viticulture could be an added threat, as are too frequent fires. The ecosystem status of the habitat, from a vegetation perspective, is Endangered (Rouget *et al.* 2004).

#### CONSERVATION

The southwestern side of the Badsberg is in a nature conservancy. Updated technical advice on the removal of *Hakea sericea* (Schrad.) J.C.Wendl. (Proteaceae) is needed, coupled with practical implementation. Some of the local farmers appear to have incorrectly perceived fire as an eradication method. What is needed, is focal integrated control using mechanical control of *H. sericea* possibly coupled with biological control. There should be no further upslope extension of vineyards at the only known remaining habitat. Further searching for possible additional localities, as well as autecological and synecological study, is required. A pioneering partnership between the Botanical Society of South Africa and the SA Wine and Brandy Company has been launched (Williams 2005). The aim of this initiative is to minimise loss of biodiversity.

### *Aloeides carolynnae aurata* Pringle, 1994

**Type locality** SA: [WC]—‘Witsand, Western Cape Province’.

**Common name** De Hoop Copper, De Hoop-kopervlerkie (A).

**Status** Vulnerable [VU D2].

**Distribution** SA: WC—Witsand, near the mouth of the Breede River, Ouplaas and De Hoop Nature Reserve.

#### ECOLOGY

**Range & population** This butterfly is known from a few small localities between Witsand (near the mouth of the Breede River) and limestone ridges on the northern border of the De Hoop Nature Reserve. The extent of occurrence is about 100 km<sup>2</sup>, but the area of occupancy of the small localities is considerably smaller. The population size of the largest colony is estimated at only a few hundred in a good year and those of the smaller colonies at less than 100, based on population counts during the flight period.

**Habitat** The locality near Witsand is found in the vegetation type described as Albertinia Sand Fynbos (Mucina & Rutherford 2006). The locality near De Hoop Nature Reserve is in De Hoop Limestone Fynbos (Mucina & Rutherford 2006). Both localities are small, the latter being larger than the former.

**Habits** Nothing published. An autecological study is needed. The adult insects have short bursts of a rapid ‘whirligig’ type of flight before settling on the ground/sand or rocks.

#### RATIONALE

This race is known from fewer than six small colonies over a restricted range extending over about 40 km between Witsand, near the mouth of the Breede River, and the limestone hills between the farm Ouplaas and De Hoop Nature Reserve. There is a declining population trend in the eastern portion of its small

range, based on population counts. This taxon has not been included in a Red Data Book or Red-Listed before.

#### THREATS

There are no immediate threats, but agricultural development, new roads or housing could severely impact on the habitats. Fire frequency and grazing also have to be monitored. A number of properties near some of the localities may become available for sale and the associated development has to be monitored. The ecosystem status of the habitat, from a vegetation perspective, is Vulnerable (Rouget *et al.* 2004).

#### CONSERVATION

No conservation measures have been taken. Research is needed to look for other colonies. Management plans are needed for the different localities, taking the presumed larval ant associations into consideration. Regular ongoing monitoring of the known habitats is needed.

### *Aloeides lutescens* Tite & Dickson, 1968

**Type locality** SA: [WC]—'Cape Province: Below De Wets Berg, Brand Vlei'.

**Common name** Worcester Copper, Worcester-kopervlerkie (A).

**Status** Vulnerable [VU B1ab(ii)+2ab(ii)].

**Distribution** SA: WC—known only from Brandvlei, Worcester and the Roodeberg.

#### ECOLOGY

**Range & population** The type locality is on the eastern side of the Brandvlei Dam near Worcester in the Western Cape Province. There has been a significant reduction in both the area of occupancy as well as the number of specimens there over the last 20 years. A further small locality has been located about 20 km southeast of Worcester. There are probably less than 300 adult specimens annually, based on population counts during the flight period.

**Habitat** Habitat at a moderate elevation, 200 to 300 m, with sparse karroid scrub vegetation and open sandy soil. The vegetation type is known as Breede Sand Fynbos (Mucina & Rutherford 2006).

**Habits** No life cycle information published. The larval host plant (by inference) is probably an *Aspalathus* species (Fabaceae) (Pringle *et al.* 1994).

#### RATIONALE

This species was never widespread and has now disappeared from some of its former sites near the Brandvlei Dam. It is currently known only from two sites, which are not in reserves and are partially disturbed. This taxon was included as Rare in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b). It has a narrow habitat specificity, based on the size of the colonies, a

medium-sized geographic range, low abundance and a declining population trend. Habitat change may cause this butterfly species to become more threatened in the near future.

#### THREATS

Continued development in the area is a threat as is habitat destruction, farming and other habitat modification. The ecosystem status of the habitat, from a vegetation perspective, is Vulnerable (Rouget *et al.* 2004).

#### CONSERVATION

There are no conservation measures in force. Population levels should be monitored. Further localities should be sought.

### *Aloeides nubilus* Henning & Henning, 1982

**Type locality** SA: [M]—'Klipbankspruit, Sabie, Transvaal'.

**Common name** Cloud Copper, Wolk-kopervlerkie (A).

**Status** Endangered [EN A3ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)].

**Distribution** SA: M.

#### ECOLOGY

**Range & population** First found at Klipbankspruit near Sabie, on the Long Tom Pass, it was subsequently found near Mount Sheba Nature Reserve, and further localities have been found nearby at Robbers Pass in the Morgenzon Forestry area, at Trout Hideaway and in the Sterkspruit Nature Reserve. A maximum of about 20 specimens may be seen flying on a good day. Owing to its restricted flight period and apparent specific habitat requirements, the colony at Robbers Pass, based on results of research on similar colonies, would consist of about 200 specimens emerging annually (G.A. Henning & Roos 2000a,b).

**Habitat** Ridges on mist-belt fire-climax grassland at altitudes above 1 800 m in Lydenburg Montane Grassland in the Mesic Highveld Grassland Bioregion of the Grassland Biome Unit (Mucina & Rutherford 2006). The localities are subject to frost and snow. The colony at Robbers Pass is confined to a small area on a high ridge. The ridge has quartzitic elements and runs east-west, with a northern face.

**Habits** The males establish territories around prominent rocks and settle on bare sandy patches. The females spend much time on the ground.

**Flight period** September to early November.

**Early stages** Nothing has been published. Larval food plant: probably *Rothea hirsuta* (Hochst.) R.Fern. (= *Clerodendrum triphyllum* (Harv.) H.Pearson) (Lamiaceae) (Gilbert & McDermott, pers. obs.).

**RATIONALE**

Currently known from four small and threatened localities, with low levels of abundance and occupancy. Habitat modification at the type locality has caused local extinction. This species has narrow habitat specificity, a smallish geographic range and a declining population trend. The area of occupancy of *Aloeides nubilus* is limited and constitutes an area smaller than 50 km<sup>2</sup>. Lack of dispersal routes and corridors may become a major concern for the long-term survival of the butterfly. It was included as Rare in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b).

**THREATS**

The colony at Robbers Pass, Morgenzon Forestry, is restricted to a ridge a few hundred metres long and with a black wattle, *Acacia mearnsii* De Wild. (Fabaceae), infestation. There is another colony on the top of the escarpment at Trout Hideaway a few kilometres to the south. The colony in Sterkspruit Nature Reserve was threatened by expansion of a pine plantation but this plantation has since been chopped down. The ecosystem status of the habitat, from a vegetation perspective, is Endangered (Rouget *et al.* 2004).

**CONSERVATION**

Population levels and habitat quality should be monitored regularly. There should be no further habitat encroachment due to either plantation forestry or infestation of alien trees. The latter should be removed. Plantation forestry should be subject to environmental impact assessments. Autecological studies are needed. There are no conservation measures in force.

***Aloeides clarki* Tite & Dickson, 1968**

**Type locality** SA: [EC]—'Cape Province: Aloes-Coega Flats'.

**Common name** Coega Copper, Coega-kopervlerkie (A).

**Status** Endangered [EN A3ce; B2ab(i,ii,iii,iv,v)].

**Distribution** SA: EC.

**ECOLOGY**

**Range & population** The area of occupancy (< 5 km<sup>2</sup>) is considerably smaller than the range of the butterfly species (110 km<sup>2</sup>). It was formerly known from more localities in the Sundays River and Aloes-Coega Flats area but these have been destroyed by habitat modification. The combined population is declining, based on population counts.

**Habitat** The taxon is found on dry, sandy and limestone ridges at an altitude of 30 to 150 m in Coega Bontveld in the Albany Thicket Biome Unit (Mucina & Rutherford 2006), also known as Valley Thicket (Low & Rebelo 1998) in the Albany Centre of Plant Endemism (Van Wyk & Smith 2001).

**Early stages** The early stages up to the fourth larval instar have been described (Tite & Dickson 1968, 1973). Larval food plant: an *Aspalathus* species (Fabaceae) (Clark & Dickson 1971). The larval ant association is not known.

**RATIONALE**

This taxon was once considerably more widespread in the Eastern Cape. The type locality at Aloes (just north of Port Elizabeth) was destroyed by industrial development. The species has fairly narrow habitat specificity, a medium-sized geographic range and moderate abundance. It was listed as Rare in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b).

**THREATS**

Industrial development has already destroyed a number of localities in the Aloes-Coega flats area. The Coega Industrial Development Zone will possibly have, among other industries, an aluminium smelter, a chlorine refinery and a precision strip mill (Richardson 2005). Further development and airborne pollution will remain a concern. An informal settlement near Coega village has been disbanded and relocated (Pringle 2002). Informal settlements may remain a future threat. The ecosystem status of the habitats, from a vegetation perspective, varies from Vulnerable to Least Threatened (Rouget *et al.* 2004).

**CONSERVATION**

One of the localities in the Sundays River Valley is in a reserve controlled by the Eastern Cape Department of Nature Conservation. Habitat has also been set aside as a reserve near the site of a huge industrial project known as the Coega Industrial Development Zone. A 100-m buffer zone will surround this development. Time will tell whether this is adequate or not. The Lepidopterists' Society of Africa is liaising with the environmental manager of the Coega IDZ to minimise habitat degradation (Pringle 2002). This site as well as the general area needs careful monitoring. A further smaller locality near the Grassridge road on the Coega flats was at risk owing to a proposed quarry but it has fortunately been halted. Autecological study of the taxon as well as population monitoring is needed.

***Aloeides dentatis* (Swierstra, 1909)**

**Type locality** [SA: G]—'Waterval Onder'. Now considered to be a locality near Pretoria, Gauteng, incorrectly thought to be the town of the same name in Mpumalanga (G.A. Henning).

**Distribution** L; SA: FS and G.

**ECOLOGY**

**Range & population** Montane grassland, 1 500–1 900 m.

**Habitat** Grassland.

**Habits** It requires protection by ants and a predictable environment. The species is sedentary, with strict population control due to finite facilities in *Lepisiota* ant nests. Males are strongly territorial and need open gravel patches as territorial sites.

**Early stages** *Aloeides dentatis dentatis*; Tite & Dickson (1973). S.F. Henning (1983a) (Witpoortjie, Gauteng). S.F. Henning (1983b, 1984b). S.F. Henning & G.A. Henning (1985). S.F. Henning (1987a, 1987b). S.F. Henning & G.A. Henning (1989). Larval food: *Hermannia depressa* N.E.Br. (Sterculiaceae) (S.F. Henning 1983a; Witpoortjie, near Krugersdorp, Gauteng = Ruimsig Entomological Reserve and Klipriviersberg Nature Reserve); *Lotononis* species (Fabaceae) (G.A. Henning 1988a: 13; Suikerbosrand Nature Reserve, Gauteng). *L. eriantha* Benth. (Fabaceae) (G.A. Henning 1988b: 9; Suikerbosrand Nature Reserve, Gauteng). *A. dentatis maseruna*; *H. jacobaeifolia* (Turcz.) R.A.Dyer (Sterculiaceae), (S.F. Henning & G.A. Henning 1989) from Boons, North West Province (G.A. Henning 1988a, b: 13; Heilbron, Free State. *H. althaeifolia* L. (Sterculiaceae) (Pringle *et al.* 1994; in captivity). Associated ant: *Lepisiota capensis* (Mayr.) (S.F. Henning 1983a; Witpoortjie, Gauteng; as *Acantholepis capensis*).

## *Aloeides dentatis dentatis* (Swierstra, 1909)

**Type locality** [SA: G]—‘Waterval Onder’ (Pretoria district).

**Common name** Roodepoort Copper, Roodepoort-kopervlerkie (A).

**Status** Vulnerable [VU B2ab(ii,iii); D2].

**Distribution** SA: G—Ruimsig Entomological Reserve (Witpoortjie), Klipriviersberg Nature Reserve, Suikerbosrand Nature Reserve.

### ECOLOGY

**Range & population** Known only from Ruimsig (Roodepoort), Heidelberg (Suikerbosrand—where there are two localities) and Klipriviersberg (west of Suikerbosrand). The species has a range of about 70 km<sup>2</sup>. The area of occupancy is smaller than 5 km<sup>2</sup>. The total population is about 300, based on population counts (Odendaal 1993).

**Habitat** Found in Carletonville Dolomite Grassland in the Grassland Biome Unit (Mucina & Rutherford 2006). This is also known as Rocky Highveld Grassland (Low & Rebelo 1998) and this butterfly is found at an elevation of 1 500 to 1 900 m.

**Ecology** The larval food plant at the Ruimsig Reserve is *Hermannia depressa* N.E.Br. (Sterculiaceae) and at Suikerbosrand *Lotononis eriantha* Benth. (Fabaceae). The larval ant association is with *Lepisiota capensis* (S.F. Henning 1983a, 1983b). This ant taxon has narrow ecological requirements and is very sensitive to biotope disturbance. In the Ruimsig Entomological Reserve the distribution of *Aloeides dentatis dentatis* can be ascribed directly to the distribution of the host ant *Lepisiota capensis*. It was noted that the host

ant preferred the open disturbed areas to the dense *Themeda* grassland. The presence of the food plant alone will not ensure the presence of the butterfly. It was therefore concluded that the butterfly prefers a disturbed community in a pioneer or early stage of succession, as exhibited by the pioneer plant species in the community. It was further concluded that the vegetation controls the distribution of the host ant and the presence of the ant is a prerequisite for the butterfly to breed (Deutschländer & Bredenkamp 1999).

### RATIONALE

*Aloeides dentatis* comprises a taxonomically difficult species complex, a situation that obscures the distributional boundaries of the subspecies outlined above. The entire species complex is more widespread than previously thought. Apart from a few stable colonies (dependent on conservation management), the number of individuals at many localities is low and unstable; these are probably subpopulations that are either declining or sink (satellite) populations in the context of the metapopulation. The distribution of *A. dentatis* is very patchy, becoming even more fragmented owing to urbanisation, agriculture and mining in the past. *A. dentatis* is not confined to large rocky outcrops (like *Chrysoritis aureus*) and occur in areas that are often very suitable (easy) for urban development and agriculture. Furthermore, since the grassland of the central plateau of South Africa is poorly conserved and heavily developed, it is believed that a number of habitats may have been lost owing to development in the past (old records exist from Pretoria, Springs and Alberton but these colonies apparently no longer exist). Currently known from three localities/populations, all of which are in reserves. Previously listed as Rare in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b). This taxon has narrow habitat specificity, a medium-sized (and shrinking) geographic range and moderate abundance. The taxonomy of the race *A. dentatis maseruna* is in a state of flux. The latter taxon (as currently understood) is fairly widespread in Lesotho and the Free State and North West Provinces, and is not threatened.

### THREATS

Despite having populations in three reserves, the threat of habitat modification due to environmental changes remains. The localities have to be continually monitored with regard to an adequate fire regime. Housing developments close to some of these habitats precludes natural burning systems. The ecosystem status of the habitats, from a vegetation perspective, varies from Vulnerable to Endangered (Rouget *et al.* 2004).

### CONSERVATION

All the habitats are in reserves. They are: (a) Ruimsig Entomological Reserve on the northwestern side of Roodepoort, (b) Suikerbosrand Nature Reserve near Heidelberg and (c) Klipriviersberg Nature Reserve west of Suikerbosrand. All three reserves are well

monitored and there is good feedback between lepidopterists and conservation officials. Population levels and habitat quality have to be regularly monitored. Urgent research on the subpopulations of the subspecies is necessary in order to construct a management plan that incorporates corridors to link these subpopulations. This species was included in an IUCN publication by S.F. Henning *et al.* (1993a).

The Ruimsig Entomological Reserve is an area of 12 ha set aside by the Roodepoort City Council in 1985 for the conservation of *Aloeides dentatis dentatis* (S.F. Henning 1994). The reserve is situated on the northwestern outskirts of the city of Roodepoort, near the Walter Sisulu National Botanical Garden, between 27°51' E longitude and 28°00' S latitude. It is approximately 1 580 m above sea level, with a typical highveld climate. The mean annual summer rainfall is 767 mm, occurring mostly between October and April. The mean temperature for January is 20°C and for July 9.5°C. Frost in winter plays an important role in the distribution of woody plant species (Kooij & Bredenkamp 1987; Deutschländer & Bredenkamp 1999). The reserve is situated in the Rocky Highveld Grassland (Bredenkamp & Van Rooyen 1998) or Bankenveld (Acocks 1988). The vegetation type is characterised by various grass species as well as an abundance of dicotyledonous forbs. The vegetation is also considered as a fire climax type (Acocks 1988). The soils of the reserve vary from dystrophic to mesotrophic red soils of the Hutton Form to shallow, rocky soils of the Glenrosa Form. Mica schist ridges are found scattered in the reserve (Bredenkamp & Bezuidenhout 1986).

### *Aloeides rossouwi* G.A. Henning & S.F. Henning, 1982

**Type locality** SA: [M]—'Stoffberg, Transvaal'.

**Common name** Rossouw's Copper, Rossouw-kopervlerkie (A).

**Status** Endangered [EN A3ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)].

**Distribution** SA: M—west of Stoffberg.

#### ECOLOGY

**Range & population** A single surviving colony is present in a quarry. Very few specimens have been recorded over the last 10 years.

**Habitat** Adults are found flying in rocky gullies at about 1 800 m in the vegetation type known as Sekhukhune Montane Grassland in the Mesic Highveld Grassland Bioregion of the Grassland Biome Unit (Mucina & Rutherford 2006). The habitat is on the escarpment southwest of Stoffberg in Mpumalanga Province. The locality is subject to high rainfall and intermittent frost.

**Habits** Adults fly energetically for short distances, settling on rocks or open soil. The males occasionally exhibit hilltopping behaviour. The larval host plant has

not been ascertained. The adults of the species have been noted from October to February.

**Early stages** S.F. Henning & G.A. Henning (1989: 82). Larval food: nothing published. Associated ant: *Lepisiota* species (S.F. Henning & G.A. Henning 1989: 82; as *Acantholepis* species).

#### RATIONALE

Currently known from only one peak where there is a single viable colony. The population trend of the species is declining and the area of occupancy is diminishing. This species has narrow habitat specificity, a small geographic range and low abundance. It was included as Rare in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b).

#### THREATS

Several colonies were identified in the area concerned but some have already become overgrown by alien invasive plants and secondary succession owing to lack of burning and are uninhabitable for the butterfly. The surviving colony is now situated in a quarry where early successional vegetation is prevalent. Next to the colony, which is fairly small, is a stand of black wattle, *Acacia mearnsii* De Wild. (Fabaceae), that is slowly invading the area. The ecosystem status of the habitat, from a vegetation perspective, is Endangered (Rouget *et al.* 2004).

#### CONSERVATION

Population levels and habitat quality should be regularly monitored. Alien invasive trees have to be regularly removed from and around the localities. An appropriate fire regime and a management plan have to be implemented and maintained. Autecological studies are needed. There are no conservation measures in force.

#### GENUS *Erikssonia* Trimen, 1891

A purely Afrotropical genus containing three species.

### *Erikssonia acraeina* Trimen, 1891

**Type locality** [Angola]—'Omrorra; Okavango River; Otiembora'.

**Common name** Eriksson's Copper, Eriksson-kopervlerkie (A).

**Status** Critically Endangered [CR A1ac+2a; B1ab(iii,v)c(iv)+2ab(iii,v)c(iv)].

**Distribution** SA: LP—known only from one locality at the base of the Perdeberg near Rankin's Pass, in the Waterberg.

#### ECOLOGY

**Range & population** The specimens from the single locality in the Waterberg comprise an undescribed species, which would render the new entity endemic to South Africa. In the present context of the species

taxonomy, localities have been recorded in southern Angola, western Zambia (Mongu) and South Africa (Limpopo Province: only near Alma in the Waterberg).

**Habitat** Known from grassy savanna, on the farm Tlodili, about 5 km north of the village of Rankin's Pass, in the Waterberg Mountains of the Limpopo Province, at 1 595 m above sea level (Dobson & Garvie 2005). The centre of the locality has GPS readings of 24°27.549'S, 27°50.571'E. The vegetation type is Central Sandy Bushveld in the Central Bushveld Bioregion of the Savanna Biome Unit (Mucina & Rutherford 2006). The colony is found on the northwestern foot of the hill named Perdeberg (G.A. Henning & S.F. Henning 2001). Trees found in the area include *Ochna pulchra* Hook.f. (Ochnaceae), *Burkea africana* Hook. (Fabaceae) and *Protea caffra* Meisn. (Proteaceae).

**Habits** The females oviposit on coarse red sand at the base of the larval food plant, *gifbossie*, *Gnidia kraussiana* Meisn. (Thymelaeaceae). This will be near the entrance to the nests of an ant of the genus *Lepisiota*. The larvae feed on the food plant nocturnally, accompanied by their attendant ants, which feed frequently from the larval honey glands (S.F. Henning 1984c). During the day they shelter in the nest of the ants. The flight is leisurely, as the adult coloration is probably aposematic.

**Flight period** November to February.

**Early stages** S.F. Henning & G.A. Henning (1984); S.F. Henning (1984c). Larval food: *Gnidia kraussiana* Meisn. var. *kraussiana* (Thymelaeaceae) (S.F. Henning & G.A. Henning 1984). Associated ant: *Lepisiota* species (S.F. Henning & G.A. Henning 1984; as *Acantholepis* species).

#### RATIONALE

Only one population is known in South Africa, with an area of occupancy of less than 1 km<sup>2</sup>. This South African taxon was listed as Vulnerable in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b). In South Africa it has very narrow habitat specificity, a tiny geographic range and low abundance (De Wet 1995). Of considerable concern is that the butterfly has not been seen by lepidopterists at the Waterberg locality in recent years (Dobson & Garvie 2005). De Wet (1995) observed an increase in numbers of adults after introducing a veld-burning programme. It appears that grass burning has been less optimal over more recent years. This has resulted in ecological succession and the locality has been covered by a dense sward of tall grass, which has shaded out the larval food plant (Dobson & Garvie 2005). Habitat change, and perhaps under-utilisation, may continue at the Waterberg locality and the population may have already become extinct there. No other localities were found despite exploration by lepidopterists and conservationists in the Marakele area.

#### THREATS

A major threat is the lack of regular burning. There were no fires between 1984 and 1989. When biennial fire cycles were introduced in 1989, the numbers of adult butterflies increased. There is no maintained conservation management. The exclusion of game and cattle (De Wet 1995) is also important from an evolutionary point of view. The habitat has been severely overgrown for many years. Severe synecological disruption of the butterfly, associated ant and the larval food plant, has been the result. The habitat is on private property. The ecosystem status of the habitat, from a vegetation perspective, is Least Threatened (Rouget *et al.* 2004).

#### CONSERVATION

No conservation measures are currently in operation. Some research by the local (then Transvaal) Provincial Department of Nature Conservation, with assistance from the Lepidopterists' Society of Africa, was carried out some time ago (S.F. Henning & G.A. Henning 1989; Dobson & Garvie 2005). The official involved moved elsewhere, and monitoring ceased. The area urgently has to be burnt and then managed. Further searching for other colonies is needed (S.F. Henning *et al.* 1993b).

#### SUBFAMILY Polyommatinae

#### TRIBE Polyommagini

#### SUBTRIBE Lycaenesthina

#### GENUS *Anthene* Doubleday, 1847

This is a largely Afrotropical genus. There are 146 species in the genus, 137 of which occur in the Afrotropical Region, the remainder are from the Oriental Region.

#### SUBGENUS *Anthene* Doubleday, 1847

#### *Anthene (Anthene) juanita* Henning & Henning, 1993

**Type locality** SA: [LP]—'South Africa: Manoutsa Park, below Strydom Tunnel, N.E. Transvaal'.

**Common name** Juanita's Hairtail, Juanita-kortstertjie (A).

**Status** Vulnerable [VU B1ab(iv)c(iv)+2ab(iv)c(iv); D1+2].

**Distribution** SA: LP—known only from the type locality, Manoutsa Park below the Strydom Tunnel, Abel Erasmus Pass.

#### ECOLOGY

**Range & population** Riverine woodland. Known only from the type series of which two females were wild caught and the holotype male and three females were found as pupae under a rock in a clearing.

**Habitat** This taxon was found in riverine vegetation on the banks of the Olifants River in the vegetation type designated as Granite Lowveld in the Savanna

Biome (Mucina & Rutherford 2006). The locality is known as Manoutsa Park and is just north of the Abel Erasmus Pass. This area is surrounded by Ohrigstad Mountain Bushveld (Mucina & Rutherford 2006).

**Habits** Not known. Two female specimens were captured while sucking fluid from wet mud. A considerable amount of further study is needed.

**Early stages** Nothing published. Four pupae were found under a rock. Larval food: nothing published.

#### RATIONALE

Only one locality is known to exist for *Anthene juanita*. It was recorded only during one day at Manoutsa Park, a locality well visited by lepidopterists. *A. juanita* must therefore be rare and, although the temptation is to describe the butterfly species as Data Deficient (DD), the rarity of *A. juanita* should be viewed in the context of the many localities in the lowveld of the Mpumalanga and Limpopo Provinces that have been explored by lepidopterists over the last century. Owing to the development of recreational facilities, the present locality may be under threat. Urgent research is necessary to establish whether the species is perhaps on its way to extinction before it was ever properly known. It was listed as Rare by G.A. Henning & S.F. Henning (1995).

#### THREATS

As this species has not been seen again following its initial discovery, one can only wonder as to its distribution and apparent rarity. The ecosystem status of the habitat, from a vegetation perspective, is Vulnerable (Rouget *et al.* 2004).

#### CONSERVATION

No conservation measures are in place. Manoutsa Park, the type locality, should receive priority as a butterfly conservation area. Conservation based on an environmental plan, including biodiversity protection of the riverine forest and general area around the type locality, is needed.

### *Anthene (Anthene) lindae* Henning & Henning, 1994

**Type locality** SA: [NC]—'Witsand, north-western Cape'.

**Common name** Linda's Hairtail, Linda-kortstertjie (A).

**Status** Vulnerable [VU D2].

**Distribution** SA: NC—known only from the Witsand Nature Reserve on the western pediment and lower slopes of the Langberg near Witsand.

#### ECOLOGY

**Range & population** The butterfly is known only from the Witsand Nature Reserve (under management of Northern Cape Nature Conservation) and from the

southwestern base of the nearby Langberg to the east. The known area of occurrence is smaller than 200 km<sup>2</sup>.

**Habitat** This butterfly is found in the ecotone between Gordonia Plains Shrubland and Olifantshoek Plains Thornveld in the Eastern Kalahari Bushveld Bioregion of the Savanna Biome Unit (Mucina & Rutherford 2006). This generally arid area has an average annual rainfall of 175 mm, mainly in summer. Temperatures range from -8°C to 42°C, with an average of 20°C. The soil is mainly sandy calcareous tufa with patches where sandy soils have accumulated. There are sparsely scattered camel thorn trees, *Acacia erioloba* E.Mey. (Fabaceae). The known habitat of the butterfly is in the catchment area on the western side of the Langberg.

**Habits** This is in many ways a Data Deficient species. A considerable amount of further study, including an autecological study, is needed. The butterfly is intimately associated with *Acacia erioloba* E.Mey. (Fabaceae), which may prove to be the larval food plant (Terblanche 1994). The species appears to be sensitive to environmental influences. During the drought years of the latter part of the 1990s and early years of this century no specimens were seen for almost 10 years despite keen search. In recent years, the species has been seen in limited numbers.

**Flight period** The butterfly is single-brooded and is found in summer, from September to early December.

**Early stages** Nothing published. Larval food: nothing published.

#### RATIONALE

*Anthene lindae* is known from fewer than five localities. The butterfly exists in a poorly explored area and may be more widespread than currently known. All the localities so far found seem to be part of a unique catchment area on the western side of the Langberg mountain chain in the Witsand area of the Northern Cape Province (Terblanche & Taylor 2000). The conservation status of the catchment area is of considerable concern and the butterfly may be under threat from farming practices and water use in the area. It was listed as Rare in G.A. Henning & S.F. Henning (1995). The butterfly has a small extent of occurrence and an even smaller area of occupancy.

#### THREATS

Habitat modification appears to be a threat. Climate warming, drought, overgrazing and the over-extraction of ground water could have serious consequences for the butterfly's habitat (Terblanche, pers. comm. 2005).

The ecosystem status of the habitat, from a vegetation perspective, is Least Threatened (Rouget *et al.* 2004).

#### CONSERVATION

Appropriate measures would follow on an autecological study with a resultant management

plan and monitoring. Overgrazing and the over-extraction of ground water in the general area should be avoided. Conserved in Witsand Nature Reserve, Northern Cape. A more ideal situation would be the inclusion of part of the Langberg in the Witsand Nature Reserve (Terblanche & Taylor 2000). Both *Anthene lindae* and *A. juanita* focus attention on the importance of the conservation of unique pediments and catchment areas and not only other 'terrestrial islands' such as those associated with montane relicts (Terblanche 2001).

#### SUBTRIBE Polyommatina

GENUS *Lepidochrysops* Hedicke, 1923

A large, purely Afrotropical genus containing 134 species.

**Early stages of the genus *Lepidochrysops*** The larvae of the few species for which they are known are phytopredacious. The larvae are phytophagous in the first two larval instars, feeding on the flower buds or developing seeds of their respective food plants. They then induce ants to carry them into their nest where they feed on the ant brood. These later larval instars are ant-nest parasites, feeding on the early stages of species of formicine ants belonging to the genus *Camponotus* (and perhaps also *Messor*) (Williams 2007). The ants continually attend to them and they are treated as if they were ant brood owing to the imitation ant brood pheromones released by the larvae (S.F. Henning 1979, 1980, 1987a,b,c). They pupate in the tunnels of the ant nest and when the adults emerge they must run, with the wings still folded, through the tunnels until they find the exit. The wings are expanded outside the nest. This complex life history restricts the habitats of some species and thereby threatens their survival.

### *Lepidochrysops ketsi* Cottrell, 1965

**Type locality** SA: [EC]—'Grahamstown (C.P.)'.

**Common name** Ketsi blue.

**Distribution** SA: M, NW, G, KZN, FS, EC, and WC.

#### ECOLOGY

**Range & population** A widespread colonial species with two described subspecies, one of which is threatened.

**Habitat** Grassland and Fynbos.

**Habits** Males establish territories and patrol around the food plants. The females fly around the food plants where the associated ant is present, usually on the slopes of hills or on flat ground. Both sexes feed at flowers.

**Flight period** October to March.

**Early stages** Cottrell (1965: 57); Clark & Dickson (1971: 37). Larval food: *Selago corymbosa* L.

(Scrophulariaceae); *Salvia* species (Lamiaceae) (Cottrell 1965); *S. geniculata* L.f. (Scrophulariaceae) (given as *Walafrida geniculata* in Pringle *et al.* 1994). Associated ant: unknown.

### *Lepidochrysops ketsi leucomacula* S.F. Henning & G.A. Henning, 1994

**Type locality** SA: [KZN]—'Margate, Natal'.

**Common name** Margate Blue, Margate-bloutjie (A).

**Status** Vulnerable [VU A3ce; B2ab(iii); D2].

**Distribution** SA: KZN, EC.

#### ECOLOGY

**Range & population** This coastal subspecies has an extent of occurrence of about 600 km<sup>2</sup>. The area of occupancy is much smaller. It has a disjunctive known occurrence and has been found between Margate and Port Edward in KwaZulu-Natal and then from near Port St Johns in the Eastern Cape. There are probably other localities in the intervening under-explored region of the Wild Coast of the Eastern Cape.

**Habitat** The butterfly is found in Pondoland-Ugu Sandstone Coastal Sourveld in the Indian Ocean Coastal Belt Biome Unit (Mucina & Rutherford 2006). The localities are within a few kilometres of the coast.

**Habits** The energetic, fast-flying adult males do not appear to display hilltopping behaviour and are found with the females in their grassy coastal localities. An autecological study is needed.

**Flight period** October to March.

**Early stages** Larval food plant and associated ant species not known.

#### RATIONALE

*Lepidochrysops ketsi leucomacula* is known from restricted grassy patches a few kilometres inland from the coast in the southern parts of KwaZulu-Natal and the northeastern parts of the Eastern Cape. This subspecies has a declining population trend and a fragmented, fairly long and narrow extent of occurrence. The area of occupancy in the eastern portion of its range has steadily diminished. In the Eastern Cape, localities may still be safe although pressure for development along this area of the coast is increasing. In KwaZulu-Natal, the butterfly has lost localities at Margate owing to urban developments. No habitat management plan is in place in conserved areas. This race was listed as Indeterminate in G.A. Henning & S.F. Henning (1995).

#### THREATS

The major threat is coastal development in southern KwaZulu-Natal as well as in the Transkei coastal region in the Eastern Cape. Possible coastal mining in the Eastern Cape needs thorough environmental

impact assessments, including attention to the insect biota. The grassland habitats also need fairly frequent fires as it is necessary for maintaining grassland structure as well as biodiversity, including associated ants. Maintaining fire regimes near urban locations is always problematic (e.g. New *et al.* 1999). Grazing would also have assisted habitat suitability in the prehistoric and historic past. Too little or too much grazing (particularly by goats) currently will also be problematic. The ecosystem status of the habitats, from a vegetation perspective, varies from Endangered to Vulnerable (Rouget *et al.* 2004).

#### CONSERVATION

The butterfly has been found in the Umtamvuna Nature Reserve in southern KwaZulu-Natal. This and other populations have to be monitored. Environmental plans including butterfly biodiversity protection have to be developed for the known habitats. Suitable reserves/conservancies, with appropriate management plans, are needed.

### *Lepidochrysoptera methymna* (Trimen, 1862)

**Type locality** [SA: WC]—'Cape Town, Mossel Bay; Cape Town'.

**Common name** Monkey blue.

**Distribution** SA: WC.

#### ECOLOGY

**Range & population** Widespread through the southern mountains of the Western Cape and adjacent Eastern Cape Province. There are two subspecies, one of which is Extinct.

**Habitat** Fynbos and Renosterveld.

**Habits** Flies on grassy slopes among rocks, often at high elevation. Males show territorial behaviour on hilltops.

**Flight period** September to January.

**Early stages** Only recorded for the nominate subspecies. Cottrell (1965); Clark & Dickson (1971); Claassens (1974, 1976); Claassens & Dickson (1980). Larval food: *Pseudoselago serrata* (P.J.Bergius) Hilliard (previously known as *Selago serrata*) (Scrophulariaceae) (Dickson 1953); *P. spuria* (L.) Hilliard (previously known as *S. spuria*) (Scrophulariaceae) (Claassens 1976); ant brood (from the third larval instar) (Claassens 1976). Associated ant: *Camponotus maculatus liengmei* For. (Claassens 1976).

### *Lepidochrysoptera methymna dicksoni* Tite, 1964

**Type locality** SA: [WC]—'Cape Province: Tygerberg Hills'.

**Common name** Dickson's Monkey Blue, Tygerberg-bloutjie (A).

**Status** Extinct [EX].

**Distribution** SA: WC—northwestern slopes of the Tygerberg Hills.

#### ECOLOGY

**Range & population** The species was known from the Tygerberg Hills, northeast of Cape Town. The range was about 4 km<sup>2</sup>.

**Habitat** The vegetation type of the habitat is (largely degraded) Swartland Shale Renosterveld in the Fynbos Biome Unit (Mucina & Rutherford 2006). Renosterveld is threatened, with more than 70% destroyed by agricultural activity (Cowling & Richardson 1995).

**Habits** Little is known. The butterfly was noted to oviposit on a *Selago* species (Scrophulariaceae) (Dickson, pers. comm. 1989). Adults exhibited hilltopping behaviour. Most likely, its larvae had an obligate ant association, similar to its congener *Lepidochrysoptera methymna methymna* (Claassens 1974, 1976).

#### RATIONALE

The isolated subspecies *dicksoni* (an Evolutionary Significant Unit) has not been recorded for over 47 years in a well-frequented and well-researched habitat within the metropole of greater Cape Town. Owing to habitat destruction *Lepidochrysoptera methymna dicksoni* seems to have already become extinct. The butterfly was described from the Tygerberg Hills, which remains the only known locality. *L. methymna dicksoni* was one of 16 butterfly species that were added to Schedule 2 of the list of protected wild animals in the Cape Province in 1976 (Ordinance No. 19 of 1974). It was listed as Endangered in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b). Nominotypical *L. methymna* is common and has a wide extent of occurrence from St Helena Bay in the Western Cape to near Port Elizabeth in the Eastern Cape (Pringle *et al.* 1994).

#### THREATS

Known only from the type locality but has not been found there for almost five decades. The area where breeding occurred (northwestern side) was destroyed by wheat farming (Dickson, pers. comm. 1989). Apparently the extinction of the only known colony was due to the cultivated lands on the hillsides eventually extending up the hill and encompassing the breeding grounds, thereby destroying the ant colonies and food plants. It has not been found on any of the other summits of the Tygerberg range. Threats included agricultural activity (wheat farming, vineyards, ploughing etc.), housing development, invasive alien vegetation and mining (a huge quarry is present, with increased dust dispersal). The ecosystem status of the habitat, from a vegetation perspective, is Critically Endangered (Rouget *et al.* 2004).

#### CONSERVATION

No conservation measures are in force. Parts of the Tygerberg Hills are in a Municipal (Tygerberg) Reserve.

*Lepidochrysops methymna dicksoni* is most probably extinct.

### *Lepidochrysops jefferyi* (Swierstra, 1909)

**Type locality** [SA: M]—‘Ulundi, near Barberton’.

**Common name** Jeffery’s Blue, Jeffery-bloutjie (A).

**Status** Endangered [EN A3ce; B1ab(ii,iii) + 2ab(ii,iii)].

**Distribution** SA: M—Barberton district, Ulundi Mine, Noordkaap, Sheba Mine and Fairview Mine.

#### ECOLOGY

**Range & population** Known only from the Barberton district of Mpumalanga. Localities include the following: Ulundi Mine, Noordkaap, Sheba Mine and Fairview Mine. All populations appear to be diminishing in size, based on population counts.

**Habitat** This butterfly is found in remnant patches of Barberton Montane Grassland in the Mesic Highveld Grassland Bioregion of the Grassland Biome Unit (Mucina & Rutherford 2006). It is noted on grassy hilltops and slopes with scattered trees. The grassland is fire climax, the rainfall is fairly high and there is no frost. Sour Lowveld Bushveld surrounds the grassy peaks. This area appears to have unique links with the high-altitude habitats of the eastern Zimbabwean highlands.

**Habits** Adult males show hilltopping behaviour. Much further research is needed.

**Flight period** October and November.

**Early stages** Nothing published. Larval food: *Ocimum obovatum* E.Mey. ex Benth. (previously known as *Becium grandiflorum*) (Lamiaceae) (Pringle *et al.* 1994). Associated ant: nothing published.

#### RATIONALE

*Lepidochrysops jefferyi* is localised and its extent of occurrence appears to be less than 500 km<sup>2</sup>. The area of occupancy of *L. jefferyi* is restricted and constitutes an area smaller than 50 km<sup>2</sup>. No more than five localities are known. The prospect of mining in the area of its habitats and the presence of plantations of alien *Eucalyptus* trees in the vicinity of the habitats are threats to the future of the butterfly. No conservation action plan is in place. The species was listed as Rare in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b). It has narrow habitat specificity, a small geographic range, moderate abundance and a declining population trend.

#### THREATS

Mining, informal settlements and development for recreational purposes appear to be incipient threats. This area has been proclaimed as the Mountainlands Nature Reserve, but mining is still a very real threat

and there are possibly plans to mine in the nature reserve, near the butterfly localities. The ecosystem status of the habitat, from a vegetation perspective, is Vulnerable (Rouget *et al.* 2004).

#### CONSERVATION

An area known as the Mountainlands Nature Reserve has been proclaimed. However, there has been talk of plans to mine in the reserve, near the residual butterfly localities.

### *Lepidochrysops irvingi* Swanepoel, 1947

**Type locality** [SA: M]—‘Nelshoogte, Barberton district, Transvaal’.

**Common name** Irving’s Blue, Irving-bloutjie (A).

**Status** Vulnerable [VU A3ce; B2ab(i,ii,iii,iv,v)].

**Distribution** SA and SW: escarpment of M and SW. In Mpumalanga it occurs near Graskop, near Sabie and also at its type locality at Nelshoogte near Barberton.

#### ECOLOGY

**Range & population** This butterfly is found in a few patches of montane grassland in northern Swaziland and northeastern Mpumalanga. The known Mpumalanga habitats are found near Graskop, Sabie and Nelshoogte, west of Barberton. The extent of occurrence is about 10 500 km<sup>2</sup>. The area of occupancy is much smaller. Population numbers have not been quantified.

**Habitat** The vegetation types where the butterfly is found are Barberton Montane Grassland and Northern Escarpment Dolomite Grassland in the Mesic Highveld Grassland Bioregion of the Grassland Biome Unit (Mucina & Rutherford 2006). The soil is mostly shallow lithosols derived from rock types. Summer rainfall varies from 700 to 1 100 mm per annum. Temperatures range from -8°C to 39°C, with an average of 15°C for the specific vegetation type as a whole (Bredenkamp *et al.* 1998).

**Habits** This early-summer univoltine insect flies in fire-dominated high montane grassland. Frequent fire is necessary for maintaining grassland structure and phytodiversity as well as the faunal and, in particular, the entomo-faunal structure. Autecological study is needed. *Lepidochrysops irvingi* may be found abundantly on selected hillsides where the larval host plants occur.

**Flight period** September to November.

**Early stages** Nothing published. Larval food: oviposits on *Ocimum* species including *O. obovatum* E.Mey. ex Benth. (Lamiaceae) (Pringle *et al.* 1994). Associated ant: nothing published.

#### RATIONALE

Fewer than 10 localities are known. At times, the adults may be very abundant in their restricted habitats. Lack of dispersal routes and corridors may

be a major concern for the long-term survival of the butterfly. It was not listed in S.F. Henning & G.A. Henning (1989), G.A. Henning & S.F. Henning (1992b) or G.A. Henning & S.F. Henning (1995). This species has a declining population trend as its extent of occurrence and area of occupancy have diminished over the past 30 years.

### THREATS

The most significant threat is the destruction of the habitats of the butterfly by invasive alien vegetation, particularly but not exclusively black wattle, *Acacia mearnsii* De Wild. (Fabaceae). Commercial afforestation has been the major factor in the destruction of the biodiversity-rich high-rainfall grasslands on the eastern escarpment of South Africa (Matthews *et al.* 1993) in general and of a number of South Africa's grassland butterfly species habitats in particular. Ironically, in the past the focus has been on conserving small patches of floristically poor Afromontane forest while ignoring the biodiversity-rich grasslands (Van Wyk & Smith 2001). The suppression of fire near plantations appears to have had a very negative effect on grassland insect diversity (Samways *et al.* 1996). The ecosystem status of the habitats, from a vegetation perspective, varies from Endangered to Vulnerable (Rouget *et al.* 2004).

### CONSERVATION

No conservation measures are currently in place. An environmental plan for the biodiversity and protection of this and other 'at risk' mesic grassland butterflies has to be developed, instituted and maintained (together with monitoring) in Mpumalanga and Swaziland.

## *Lepidochrysops swanepoeli* (Pennington, 1948)

**Type locality** [SA: M]—'Sheba Mine, Barberton District, Transvaal'.

**Common name** Swanepoel's Blue, Swanepoel-bloutjie (A).

**Status** Vulnerable [VU A3ce; B1ab(ii,iii)+2ab(ii,iii)].

**Distribution** SA: M—Sheba and Fairview Mines, Barberton district. A single doubtful record from KwaZulu-Natal at Mount Ngwibi was reported by Pennington (1951).

### ECOLOGY

**Range & population** Occurs in the Barberton district of Mpumalanga. Known from the Sheba and Fairview Mines. All populations appear to be diminishing in size, based on population counts.

**Habitat** The species is found on grassy peaks with residual Barberton Montane Grassland in the Mesic Highveld Grassland Bioregion of the Grassland Biome Unit (Mucina & Rutherford 2006). The grassland is fire climax with a fairly high rainfall and there is no frost. Sour Lowveld Bushveld surrounds the grassy peaks.

**Habits** This taxon occurs on grassy hills where the larval food plant grows. Males establish territories on hilltops. Further study is needed.

**Flight period** September to early December.

**Early stages** Nothing published. Larval food: *Ocimum obovatum* E.Mey. ex Benth. (Lamiaceae) (Pringle *et al.* 1994). Associated ant: nothing published.

### RATIONALE

This species is restricted to a few grassy hills near Barberton. *Lepidochrysops swanepoeli* is localised and its extent of occurrence needs further research since there is a doubtful old record from KwaZulu-Natal that has to be verified. *L. swanepoeli* is confined to an area of occupancy smaller than 50 km<sup>2</sup>. No more than 10 localities are known. No conservation action plan is in place. This species was previously listed as Rare in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b). This taxon has fairly narrow habitat specificity, a medium-sized geographic range and a smallish (and declining) abundance, based on the personal observations of a number of Gauteng lepidopterists.

### THREATS

The prospect of mining and informal settlements in the area of its habitats and the presence of plantations of alien *Eucalyptus* trees in the vicinity of the habitats are threats to the future of the butterfly. There is also the danger of development for recreational purposes and the possibility of expanded mining in the Mountainlands Nature Reserve, very close to the locality of this taxon (as well as that of *Lepidochrysops jefferyi* and *Aloeides barbara*). Increased grazing pressure may also be a threat. The ecosystem status of the habitat, from a vegetation perspective, is Vulnerable (Rouget *et al.* 2004).

### CONSERVATION

The type locality near Barberton (Sheba Mine) is in the Mountainlands Nature Reserve. The 'integrity' of this reserve has to be preserved.

## *Lepidochrysops hypopolia* (Trimen & Bowker, 1887)

**Type locality** [SA: KZN, NW]—'Natal. Upper Districts. - Blue Bank, near Drakensberg; Transvaal - Potchefstroom District'.

**Common name** Morant's Blue, Morant-bloutjie (A).

**Status** Extinct [EX].

**Distribution** SA: KZN—Blue Bank, near Ladysmith; NW—Potchefstroom.

### ECOLOGY

**Range & population** Blue Bank, near Ladysmith in KwaZulu-Natal (two males caught by Walter Morant on 21 September 1870), and near Potchefstroom

(North West Province) (one male *leg.* Thomas Ayres in 1879).

**Habitat** Possibly KwaZulu-Natal Highland Thornveld (Sub-Escarpment Grassland Bioregion) and Carletonville Dolomite Grassland (Dry Highveld Grassland Bioregion) in the Grassland Biome Unit (Mucina *et al.* 2005). The exact localities are unknown. The identity of a single putative female, collected by C.W. Morrison near Estcourt (KwaZulu-Natal), is unconfirmed. The Morant specimens are in The Natural History Museum (BMNH), London, and the Ayres specimen is in the South African Museum (SAM), Cape Town.

#### RATIONALE

No verified specimens have been seen since 1879. There are only three known specimens of this taxon. The undersurfaces of the specimens are lighter (more 'hoary') than the closely related (probable sister species) *Lepidochrysops praeterita* Swanepoel. There was some speculation that the three known specimens were possibly chemically bleached examples of *L. praeterita* (G.A. Henning, pers. comm. 2004). If this is the case, then the two taxa are conspecific. However, the upper surfaces are not bleached and the outer margins of the forewings of the male specimens are more convex than in *L. praeterita*. This taxon was listed as Extinct in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b).

#### THREATS

No locality is known and therefore no threats can be identified.

#### CONSERVATION

Technically (IUCN categories) the species is regarded as Extinct.

### *Lepidochrysops praeterita* Swanepoel, 1962

**Type locality** SA: [NW]—'New Doornfontein Mine (Potchefstroom Distr., Tvl.)'.

**Common name** Highveld Blue, Hoëveldbloutjie (A).

**Status** Endangered [EN A2c; B1ab(iv)+2ab(iv)].

**Distribution** SA: NW—Potchefstroom; G—Carletonville, Walkers Fruit Farms; FS—Sasolburg.

#### ECOLOGY

**Range & population** This taxon is found on a few koppies and rocky hillsides between Potchefstroom in the North West Province and Sasolburg in the Free State.

**Habitat** The vegetation types where this butterfly is found are Soweto Highveld Grassland and Rand Highveld Grassland in the Mesic Highveld Grassland Bioregion of the Grassland Biome Unit (Mucina & Rutherford 2005).

**Habits** The adults fly around the rocky ridges in its habitat. Males patrol a selected ridge and begin this territorial behaviour at about 10:00 in the morning. Isolated trees are often used as focal points and males patrol around them. Once the females have been mated, they fly around the slopes searching for food plants on which to lay eggs, or feed at flowers.

**Flight period** Early September to October.

**Early stages** Nothing published. Larval food: *Ocimum obovatum* E.Mey. ex Benth. (Lamiaceae) (Pringle *et al.* 1994). Associated ant: nothing published.

#### RATIONALE

Fewer than five confirmed viable localities of *Lepidochrysops praeterita* are known to exist today. The butterfly is localised and a more quantitative analysis of its area of occupancy would most likely confirm the endangered category proposed here. Of considerable concern is the number of localities where *L. praeterita* seems to have become rarer in terms of numbers or has disappeared over the last two decades. *L. praeterita* has not been found at the well-known locality near Potchefstroom for more than two decades. It has also been very scarce at its Carletonville locality in recent years. This species was not previously listed in the Red Data Book or Red-Listed. It has a fairly narrow habitat specificity and a large geographic range but has shown a fairly rapid decline in both number of localities as well as numbers of emerging adults each year over the last 20 years.

#### THREATS

Habitat degradation owing to lack of burning diminishes the quality and quantity of the larval food plant and associated ant habitat. The recent drought has compounded the problem. The effects of airborne pollution are an unquantifiable factor. The ecosystem status of the habitats, from a vegetation perspective, varies from Endangered to Vulnerable (Rouget *et al.* 2004).

#### CONSERVATION

No conservation measures are in place. Population levels and habitat quality have to be monitored regularly. An appropriate management plan, including a suitable fire regime, has to be implemented and maintained.

### *Lepidochrysops lotana* Swanepoel, 1962

**Type locality** SA: [LP]—'Farm Rietvlei (Pietersburg Distr., Tvl.)'.

**Common name** Lotana Blue, Lotana-bloutjie (A).

**Status** Critically Endangered [CR B1ab(i,ii,iii,iv,v)+2a (i,ii,iii,iv,v)].

**Distribution** SA: LP—known only from three localities, the type locality on the farm Rietvlei 30 km

southwest of Polokwane, on the Wolkberg east of Polokwane and in the Legalameetse Nature Reserve.

### ECOLOGY

**Range & population** Found on the farm Rietvlei, 30 km southwest of Polokwane (formerly Pietersburg), on the Ysterberg, as well as east of Polokwane, next to the road between Moria and the Serala Forest, on the Wolkberg and the Legalameetse Nature Reserve in the Limpopo Province.

**Habitat** The vegetation type of the habitat is Strydpoort Summit Grassland in the Mesic Highveld Grassland Bioregion of the Grassland Biome (Mucina & Rutherford 2006).

**Habits** It inhabits the lower slopes of the grassy hills on the western side of the Ysterberg and the opposite east-facing slope.

**Flight period** It flies from the end of September to early November.

**Early stages** Nothing published. Larval food: *Ocimum obovatum* E.Mey. ex Benth. (Lamiaceae) (Woodhall 2005; as *Becium obovatum*). Associated ant: nothing published.

### RATIONALE

This butterfly is currently known from only three populations, one at the type locality and the other two east of Polokwane. It has not been observed at the type locality for at least 10 years. This species was listed as Vulnerable in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b). It has narrow habitat specificity, a smallish geographic range and a very low abundance, and although not historically abundant, it has a declining population trend. Habitat change in the near future may cause this butterfly species to become extinct. It is also very localised at any habitat. The extent of occurrence is far below 100 km<sup>2</sup> and the area of occupancy smaller than 10 km<sup>2</sup>. No conservation management practices are currently in place.

### THREATS

Cattle grazing, a number of years of drought and a lack of burning have seriously degraded the type locality. Several visits over the last few years by the Dobsons and Williams failed to reveal evidence of adult butterflies. It was also observed that only very few flowering specimens of the larval host plant were in evidence (J. & C. Dobson & M.C. Williams, unpublished). The locality, in the Wolkberg, has so far yielded only a single female of disputed taxonomic affinity. A couple of males were recorded by M.C. Williams on the grassy hills in the Legalameetse Nature Reserve. The ecosystem status of the habitat, from a vegetation perspective, is Least Threatened (Rouget *et al.* 2004).

### CONSERVATION

No conservation measures are in place. A couple of specimens were recently recorded in the

Legalameetse Nature Reserve. Only two potentially viable localities are known. Urgent research is necessary to establish a habitat management plan for *Lepidochrysops lotana*. Further searches for localities is urgently needed.

## *Lepidochrysops pephredo* (Trimen, 1889)

**Type locality** [SA: KZN]—'Upper Districts. - Estcourt'.

**Common name** Estcourt Blue, Estcourt-bloutjie (A).

**Status** Vulnerable [VU B2ab(iii)].

**Distribution** SA: KZN—from the midlands to the escarpment. Localities include Estcourt, Griffin's Hill, Willow Grange (Estcourt district), Mount Arrochar (Mooi River district), Bulwer and near the Mont-aux-Sources Hotel.

### ECOLOGY

**Range & population** It is known from a number of high-altitude grassy hills where there are small colonies. It has a limited distribution in KwaZulu-Natal.

**Habitat** Found on grassy slopes and rocky ridges in the following vegetation types: Northern and Southern KwaZulu-Natal Moist Grassland as well as Mooi River Highveld Grassland in the Sub-Escarpment Grassland Bioregion of the Grassland Biome Unit (Mucina & Rutherford 2006).

**Habits** The adults use *Ocimum* (Lamiaceae) as a nectar source. Males establish territories on hilltops and perch on the ground or on low plants. Females are usually found on the lower slopes of the hills around the larval food plant.

**Flight period** October and November.

**Early stages** Eggs are laid on flower buds of the food plant. Early instar larvae are phytophagous, later becoming carnivorous on ant brood (S.F. Henning & G.A. Henning 1989). Larval food: *Ocimum obovatum* E.Mey. ex Benth. (Lamiaceae) (listed as *Becium grandiflorum* in Pringle *et al.* 1994: 246). Associated ant: nothing published.

### RATIONALE

Fewer than 10 localities of *Lepidochrysops pephredo* are known in an area that ranges from the KwaZulu-Natal midlands to the foothills of the Drakensberg near the Amphitheatre. Agricultural development, especially pine or blue gum plantations that have become characteristic of the KwaZulu-Natal midlands, pose a threat to the grassland habitats of *L. pephredo* and inevitably result in the loss of habitats. A few small, disjunctive colonies/subpopulations are known. The numbers of colonies appear to be diminishing, both in size and in numbers of adult butterflies, based on population counts. The species was listed as Rare in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b). It has narrow habitat

specificity, a large geographic range and moderate abundance.

### THREATS

Habitat modification is a threat. The ecosystem status of the habitats, from a vegetation perspective, varies from Least Threatened to Vulnerable (Rouget *et al.* 2004).

### CONSERVATION

The species has been recorded in the Royal Natal National Park near the Mont-aux-Sources Hotel in KwaZulu-Natal. Elsewhere there is no 'formal' protection. A great deal more information on this taxon is needed.

## *Lepidochrysops rossouwi* G.A. Henning & S.F. Henning, 1994

**Type locality** SA: [M]—'Stoffberg, Transvaal'.

**Common name** Rossouw's Blue, Rossouw-bloutjie (A).

**Status** Vulnerable [VU A3ce; B2ab(iii)].

**Distribution** SA: M—eastern slopes of the escarpment southwest of Stoffberg; at Nebo, 6 km north of Stoffberg and on a low hill to the east of Lydenburg. Botswana: it has also been recorded from Kanu in southeastern Botswana but whether this material is conspecific has to be investigated further.

### ECOLOGY

**Range & population** This species is found on the grassy escarpment in the Lydenburg and Stoffberg areas of Mpumalanga as well as at a single Botswana locality. The area of occupancy within the extent of occurrence (less than 2 000 km<sup>2</sup>) has reduced considerably over the last 20 years. The combined annual adult population is probably considerably less than 2 000 individuals, based on population counts. No accurate quantitative data are available.

**Habitat** The vegetation type where this butterfly is found is Lydenburg Montane Grassland in the Mesic Highveld Grassland Bioregion of the Grassland Biome Unit (Mucina & Rutherford 2006). The localities receive extremes of weather, including heat, cold and precipitation.

**Habits** Adults are found in rocky gullies on hillsides and hilltops of the grassy escarpment. Males establish territories on hilltops and around prominent features such as isolated trees, but females are found on the lower slopes where they oviposit on *Lantana rugosa* Thunb. (Verbenaceae).

**Flight period** September to March. The insect is multivoltine.

**Early stages** Larval host plant: *Lantana rugosa* Thunb. (Verbenaceae) (Williams cited by G.A. Henning & S.F. Henning in Pringle *et al.* 1994). Associated ant: the larvae feed on the brood of *Camponotus maculatus*

ants from the third instar onwards (Williams cited by G.A. Henning & S.F. Henning in Pringle *et al.* 1994; Woodhall 2005).

### RATIONALE

No more than 10 localities are known on a few mountain peaks. Fragmentation and contraction of its remaining habitats are very likely due to the increase of alien invasive species such as the black wattle, *Acacia mearnsii* De Wild. No conservation action plan is in place. There has been a significant declining population trend coupled with a reduction of known localities. The area of occupancy within the extent of occurrence has been reduced considerably over the last 20 years, based on the personal observations of many lepidopterists. This species has not been included in a Red Data Book or Red List previously.

### THREATS

Habitat fragmentation, contraction and modification, inappropriate fire 'regimes' with altered fire frequency and intensity owing to an increased fire load have to be addressed. The ecosystem status of the habitat, from a vegetation perspective, is Vulnerable (Rouget *et al.* 2004).

### CONSERVATION

There are no conservation measures in force. A conservation management plan coupled with autecological and ongoing quantitative assessment is needed.

### GENUS *Orachrysops* Vári, 1986

An Afrotropical genus containing 11 species, confined to South Africa, Swaziland and Lesotho.

## *Orachrysops ariadne* (Butler, 1898)

**Type locality** [SA: KZN]—'Karkloof, Natal'.

**Common name** Karkloof Blue, Karkloof-bloutjie (A).

**Status** Endangered [EN B1ab(iii) + 2ab(iii)].

**Distribution** SA: KZN—midlands at Karkloof, Benvie Estates, Wahroonga, Klaarkloof and at Nkandla near Eshowe.

**Range & population** Known only from a few small localities in the midlands of KwaZulu-Natal. The known localities are: The Start (29°24'S 30°17'E, at about 1 080 m), Wahroonga (29°36'S 30°07'E, 1 320–1 440 m), Stirling (29°35'S 30°08'E, at about 1 460 m), and Nkandla (28°42'S 31°08'E, 1 100–1 200 m) (Lu & Samways 2002a). There has been no record from the locality just south of Balgowan for about 60 years.

**Habitat** The vegetation type of the habitat is Midlands Mistbelt Grassland in the Sub-Escarpment Grassland Bioregion of the Grassland Biome (Mucina & Rutherford 2006). This was previously known as Moist Midlands Mistbelt (Camp 1999) [Mistbelt Grassland (Acocks 1988)] and occurs at altitudes of 1 080 to 1 440 m. The colony at Nkandla is in Ngongoni Veld

(Acocks 1988). The rainfall ranges from 700 to 1 300 mm per year (Lu & Samways 2002a).

**Habits** Oviposition sites on south-facing slopes are a limiting factor in the life cycle. The flight is brisk and elusive. Detailed information on the behavioural ecology of the species is given in Lu & Samways (2002a).

**Flight period** The species is univoltine and adults fly in the long grass near the food plant in March and April.

**Early stages** Larval food: *Indigofera woodii* Bolus var. *laxa* Bolus (Fabaceae) (Lu & Samways 2001). Associated ant: *Camponotus natalensis* (F. Smith) (Formicidae) (Lu & Samways 2001).

### RATIONALE

Only four localities for *Orachrysops ariadne* are currently known and they are restricted to small areas less than 10 ha in extent (Lu & Samways 2001). Karkloof Blue numbers have been declining by as much as 80% in one of the extant monitored subpopulations (based on egg counts) (Armstrong 2004). The species was listed as Rare in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b) and as Vulnerable in the updated 1995 Red List of G.A. Henning & S.F. Henning (1995). It has very narrow habitat specificity, a smallish geographic range and low abundance.

### THREATS

A couple of colonies have already disappeared and the species seems to be very restricted in colony size. Invasive alien plants (including bramble, wattle and bugweed), heavy cattle grazing, plantation forestry and habitat modification remain threats. The rate of land transformation and habitat transformation in KwaZulu-Natal is faster than in the remainder of southern Africa (Scott-Shaw 1999). Only 1% of the mistbelt grassland is still extant (Armstrong in Lu & Samways 2002a). The ecosystem status of the habitats, from a vegetation perspective, is Vulnerable (Rouget *et al.* 2004).

### CONSERVATION

The habitat at Karkloof is being protected by the landowners (Lu & Samways 2002b). Two of the sites are registered as Natural Heritage Sites; this is based on an agreement of stakeholders and not on legislation (South African Natural Heritage Programme, Department of Environmental Affairs and Tourism) (Lu & Samways 2002b). The Nkandla site is within a nature reserve. This area is being affected by alien bramble (Lu & Samways 2002b). Ezemvelo KZN Wildlife is involved in preliminary monitoring of one of the subpopulations (Armstrong 2004). Appropriate habitat management plans (including an ecologically considered fire regime), coupled with legal protection of the specific habitats and public education, are needed. Included in an IUCN publication by S.F. Henning *et al.* (1993d).

## *Orachrysops mijburghi* G.A. Henning & S.F. Henning, 1994

**Type locality** SA: [FS]—'Heilbron, Orange Free State'.

**Common name** Mijburgh's Blue, Mijburgh-bloutjie (A).

**Status** Vulnerable [VU D2].

**Distribution** SA: FS—Heilbron and Petrus Steyn; G—Suikerbosrand Nature Reserve (Platkop).

### ECOLOGY

**Range & population** Known from near Heilbron and Petrus Steyn in the Free State Province. Recently a population was discovered in a new section of the Suikerbosrand Nature Reserve (Platkop) in Gauteng Province. This colony is known as the Suikerbosrand population of *Orachrysops mijburghi* since some slight differences between this population and the Heilbron population have been found during the initial taxonomic investigation (Terblanche & Edge 2007).

**Habitat** Occurs in an area where the vegetation type is Central Free State Grassland in the Dry Highveld Grassland Bioregion of the Grassland Biome Unit (Mucina & Rutherford 2006). In Gauteng the butterfly occurs in Tsakane Clay Grassland and with this addition at Doornkuil also Soweto Highveld Grassland (Mucina & Rutherford 2006). The Suikerbosrand population appears to be associated with a wetland and it is highly likely that *Orachrysops mijburghi*, at least at Suikerbosrand, is dependent on the state of the wetland for completing its life cycle. Soils along the banks of these wetlands contain patches where small stones or gravel are mixed with black turf, creating a unique ecosystem (Terblanche & Edge 2007).

**Habits** Restricted to a few (mainly south-facing) grassy slopes, where its food plant occurs.

**Flight period** October to March.

**Early stages** Nothing is published about the early stages of *Orachrysops mijburghi* in the Free State, though the larval host plant was identified as *Indigofera evansiana* Burt Davy (Fabaceae) (Pringle *et al.* 1994). The host plant of the Suikerbosrand population was found to be another species, *I. dimidiata* Vogel ex Walp. *sensu stricto* (Terblanche & Edge 2007). Terblanche & Edge (2007) reported females ovipositing on *I. dimidiata* along a damp watercourse in the new section of the Suikerbosrand Nature Reserve. Two second instar larvae were found on the leaves of *I. dimidiata* and one larger larva on the rootstock of the plant. There is probably a larval ant association (as in its congeners).

### RATIONALE

Only two localities have been found in the Free State. The type locality is not in a conservation area and no habitat management plan is in place. An *Orachrysops*

species superficially most similar to *O. mijburghi* has recently been found by Terblanche (Terblanche & Edge 2007) in Gauteng. The extent of occurrence is well below 500 km<sup>2</sup>.

#### THREATS

Agricultural activity is a threat as the extant colonies are in prime agricultural areas. The disjunct colonies could be rapidly degraded. The ecosystem status of the habitats, from a vegetation perspective, is Vulnerable (Rouget *et al.* 2004).

#### CONSERVATION

No conservation measures have been taken in the Free State Province. The Gauteng locality is in the Suikerbosrand Nature Reserve and the adjacent Platkop. General guidelines for the management of the Suikerbosrand population of *Orachrysops mijburghi* have been given by Terblanche & Edge (2007), but the importance of research to monitor these applications is noted.

### *Orachrysops montanus* G.A. Henning & S.F. Henning, 1994

**Type locality** SA: [FS]—‘Clarens, Orange Free State’.

**Common name** Golden Gate Blue, Golden Gate-bloutjie (A).

**Status** Vulnerable [VU D2].

**Distribution** SA: FS—Clarens, Golden Gate Highlands National Park.

#### ECOLOGY

**Range & population** This species is yet to be rediscovered at Clarens where it was collected in 1958. The historical extent of occurrence is less than 50 km<sup>2</sup>. The present single known area of occupancy is below Brandwag Buttress in the Golden Gate Highlands National Park and is smaller than 10 km<sup>2</sup>. Population numbers are possibly lower than 2 000 adult specimens per univoltine annual emergence, based on population counts.

**Habitat** The only known extant habitat is a south-facing area containing damp montane grassy gullies and slopes at high altitude in the Golden Gate Highlands National Park. The Biome Unit is Grassland and the vegetation type is Eastern Free State Sandy Grassland in the Mesic Highveld Grassland Bioregion (Mucina & Rutherford 2006). The *Orachrysops* genus is probably relictual from a moister palaeoclimatic era. The Golden Gate/Clarens mountains are separated from the more southerly positioned Maloti Mountains.

**Habits** Individuals fly in the damp gullies at the foot of the mountains (G.A. Henning & S.F. Henning 1994) in the grassland. Autecological study is needed.

**Flight period** December and January.

**Early stages** Larval host plant: *Indigofera* species (G.A. Henning & S.F. Henning 1994). The associated ant is not known.

#### RATIONALE

This species is currently known only from a restricted area in the Golden Gate Highlands National Park. The species was listed as Rare in G.A. Henning & S.F. Henning (1995).

#### THREATS

*Orachrysops montanus* is one of three butterfly species that are endemic to the southern slopes of mountains in the Golden Gate Highlands National Park in the Free State. Though *O. montanus* occurs in a national park, it is not necessarily safe from decline in numbers in the near future. The possible impact on the grassland habitat by bush encroachment by the indigenous tree *Leucosidea sericea* Eckl. & Zeyh. (Rosaceae) is a problem in the area and should be investigated. Fire regimes and the siting of hiking trails have to be well considered. Threats to the ecology of a possible associated ant make this taxon a narrow habitat specialist, consequently with a broader suite of possible threats. The ecosystem status of the habitat, from a vegetation perspective, is Least Threatened (Rouget *et al.* 2004).

#### CONSERVATION

No specific measures have been taken. The only known colony is in a well-managed national park. However, a specific environmental plan, including butterfly biodiversity protection and continued low-impact recreational opportunities, has to be refined. A management plan specifically for the three endemic butterflies (*Torynesis orangica*, *Pseudonympha paragaika* and *Orachrysops montanus*) in the Golden Gate Highlands National Park has to be considered and implemented. Quantitative data coupled with an autecological study of this taxon are needed. Efforts to find further colonies near Clarens have to be expanded. Every effort should be made to discover more localities of *O. montanus* since only one very restricted population is known to exist at present—a precarious situation.

### *Orachrysops niobe* (Trimen, 1862)

**Type locality** [SA: WC]—‘Knysna’.

**Common name** Brenton Blue, Brenton-bloutjie (A).

**Status** Critically Endangered [CR B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v); C2a(ii)].

**Distribution** SA: WC—Knysna, Brenton-on-Sea and Nature’s Valley.

#### ECOLOGY

**Range & population** This species was discovered by Roland Trimen at Knysna in 1858. He found only three specimens upon which he based his description

in 1862. For many years it was thought to inhabit a much larger area, but when it was rediscovered at Nature's Valley in 1977 by J.B. Ball, after not having been seen for 119 years, he soon realised that this species was confined to the southern Cape region. After a 10-year search, Ball only recorded it at Brenton-on-Sea near Knysna. This led to the discovery of a strong breeding colony at Brenton-on-Sea by E.L. Pringle (proclaimed in July 2003 as the Brenton Blue Butterfly Reserve = BBBR). Since 2001, the adult population of the only extant population at the BBBR has varied from 50 to 280 individuals per brood (Edge 2005a; Edge, pers. comm.). The area of occupancy is less than 1 km<sup>2</sup>.

**Habitat** The BBBR is situated at 90–115 m above mean sea level on a south-facing slope with an average inclination of 1 in 3 (18°), 500 m from the sea.

The Brenton peninsula was mapped as Knysna Sand Fynbos (FFd10), part of the Fynbos Biome, by Mucina & Rutherford (2006). At a finer scale, this mosaic of dune thicket, fynbos and forest was classified as Goukamma Dune Thicket, occurring on relatively fire-protected, moist, south-facing slopes of palaeodunes with rather poor calcareous aeolian soils, enriched by a build up of humic material (Vlok *et al.* 2003). A more detailed investigation into the vegetation of the BBBR classified it into nine vegetation units (Edge *et al.* 2008a) and demonstrated a highly significant association between the occurrence of the butterfly's host plant, *Indigofera erecta* Thunb. (Fabaceae), and the shade of candlewood trees, *Pterocelastrus tricuspidatus* (Lam.) Walp. (Celastraceae). The cutting of paths through the vegetation was also demonstrated to promote strong growth of the host plant (Edge 2002, 2005a; Edge *et al.* 2008a). Experiments with burning at the BBBR have been unsuccessful in promoting growth of the host plant (Edge 2005a; Edge *et al.* 2008a).

**Habits** Adult behaviour and habits were described by Edge (2008b). Males are territorial and patrol routes, often defined by open spaces within the habitat; females are found mainly in areas where there are concentrations of the host plant.

**Flight period** Double-brooded, October and November, then February and March.

**Early stages** Some aspects of the early stages were described by J.B. Ball, cited by S.F. Henning & G.A. Henning (1989), Williams (1996) and Edge & Pringle (1996). The larval host plant is *Indigofera erecta* Thunb. (Fabaceae), first noted but not identified by J.B. Ball in the late 1970s. More recently, detailed research has found that, whereas the first and second instar larvae feed on leaves of the host plant, the third and fourth instar larvae feed on the rootstock, attended by *Camponotus baynei* Arnold ants attracted by secretions of the larva's dorsal nectary organ (DNO) (Edge 2005a; Edge & Van Hamburg 2009). This is only the second time that rootstock feeding has been recorded in butterflies (see Jackson 1937 for life history of *Euchrysops crawshayi*). Cannibalism has been

recorded in the early larval stages, and is believed to play an important role in population dynamics (Edge 2005b; Edge & Van Hamburg 2009). The larvae have an obligate relationship with the *C. baynei* ants, with the ants assisting the larvae to gain access to the rootstock of the host plant.

## RATIONALE

Known only from one very small population at Brenton-on-Sea. The second colony, at Nature's Valley (about 30 km east of Plettenberg Bay), went extinct owing to housing development in the late 1980s (Ball 1997). The restricted distribution of *Orachrysops niobe* should be seen in the context that it became a well-researched species recently, so that there is little doubt about its precarious position. The last known locality is now protected within the Brenton Blue Butterfly Reserve. Re-introduction of *O. niobe* to its former habitat at Nature's Valley is being attempted, without success so far (Edge 2007). Even though this butterfly species is protected in a special nature reserve, it is in a very precarious situation. The BBBR where *O. niobe* occurs is only 1.4 ha in extent (Edge 2005a). The extent of occurrence as well as area of occupancy of *O. niobe* is 1 km<sup>2</sup>, well below the limits of 100 km<sup>2</sup> and 10 km<sup>2</sup> for being critically endangered. The species was listed as Vulnerable in S.F. Henning & G.A. Henning (1989) and G.A. Henning & S.F. Henning (1992b) and as Endangered in G.A. Henning & S.F. Henning (1995). This species has very narrow habitat specificity, a very small geographic range and low abundance.

## THREATS

While all immediate foreseeable threats to the species are under control, there are longer-term threats such as the loss of genetic diversity in a small isolated population, unforeseeable stochastic events that could cause extinction (of a climatic nature or from a runaway fire, for example), and the longer-term impact of global warming. The ecosystem status of the habitat, from a vegetation perspective, is Endangered (Rouget *et al.* 2004).

## CONSERVATION

A major campaign by the Lepidopterists' Society of Africa and several NGOs resulted in the proclamation of the BBBR in July 2003, specifically to protect the butterfly. The issues leading to the establishment of this reserve are discussed by Steenkamp & Stein (1999). The BBBR is managed by a management committee established by the Brenton Blue Trust, with representatives from all stakeholders and chaired by CapeNature. A management plan at this site has been established and is continuously refined by research (Edge 2008a). Regular monitoring of the habitat and population levels is undertaken. Expansion of the reserve is planned onto more than 20 ha of public open space to the north of the BBBR. This is a medium-term project and alteration of the habitat to make it suitable for the host plant has commenced (Edge 2007). Attempts to reintroduce the species

at the Nature's Valley fynbos reserve site (about 60 km to the east), where the butterfly originally occurred and where habitat restoration work has been undertaken, have not met with success so far because of the poor condition of the host plant population at the site, the small area of suitable habitat on the site and the absence of the host ant *Camponotus baynei* (Edge *et al.* 2008b). Furthermore, the site is threatened with being sold by the Plettenberg Bay Municipality to a property developer.

SUBFAMILY *Miletinae*

TRIBE *Miletini*

SUBTRIBE *Lachnocnemina*

GENUS *Thestor* Hübner, 1819

A purely Afrotropical genus containing 27 species restricted to southern Africa.

*Thestor dicksoni* Riley, 1954

**Type locality** [SA: WC]—'Roode Zands Mountains, above Tulbagh Kloof, Cape Province'.

**Common name** Dickson's skolly.

**Distribution** SA: WC.

**ECOLOGY**

**Range & population** Western Cape, west coast and adjacent mountains. There are three subspecies, only one of which is Threatened.

**Habitat** The nominate subspecies is found in mountain Fynbos. *Thestor dicksoni warreni* is found in Strandveld and *T. dicksoni malagas* in coastal Fynbos.

**Habits** The flight is fast and direct but it often settles on the ground or on low bushes.

**Flight period** January to April.

**Early stages** For the nominate subspecies: Riley (1954: 98); Clark & Dickson (1971: 256, plate 119). Larval food: immature stages of the ants (Clark & Dickson 1971: 256). Associated ant: *Anoplolepis custodiens* Smith, race *fallax* Mayr. (Clark & Dickson 1971: 256).

*Thestor dicksoni malagas* Dickson & Wykeham, 1994.

**Type locality** SA: [WC]—'Western Cape Province: Langebaan'.

**Common name** Atlantic Skolly, Atlantiese-skollie (A).

**Status** Vulnerable [VU D2].

**Distribution** SA: WC—Kreef Bay on the Langebaan Peninsula.

**ECOLOGY**

**Range & population** The area of occupancy corresponds with the small 4 km<sup>2</sup> extent of occurrence. The small metapopulations are found at and near Kreef Bay, on the northwestern side of the Langebaan Peninsula. This taxon has also been seen at the site of the present Saldanha Steel Works (Geertsema 2005, pers. comm.). This has to be investigated.

**Habitat** Found within 200 m of the shoreline in Langebaan Dune Strandveld, in the Fynbos Biome Unit (Mucina & Rutherford 2006). The habitat is sand, rock and low scrubby Fynbos.

**Habits** *Thestor dicksoni malagas* males have a rapid flight after which they alight on gravel or low shrubs. Appears to be univoltine. An autecological study is needed.

**Early stages** Nothing has been published about the early stages of this subspecies.

**RATIONALE**

Only one small coastal metapopulation with a very limited distribution is known. The habitat is close to some holiday homes, albeit in a private nature reserve. This butterfly was not included in S.F. Henning & G.A. Henning (1989) but was listed (as *Thestor malagas*) as Rare in G.A. Henning & S.F. Henning (1995). There are two other races of this butterfly according to Heath & Pringle (2004), *T. dicksoni dicksoni* and *T. dicksoni warreni*, neither of which is currently threatened. The situation regarding the latter subspecies has to be monitored.

**THREATS**

There are no immediate threats. Road and housing development could severely impact on the habitat. Threats to the associated ant(s) could be significant with regard to the survival of the butterfly. A significant rise in the sea level bringing saline spray drift with it could have a negative impact on the habitat. The ecosystem status of the habitat, from a vegetation perspective, is Endangered (Rouget *et al.* 2004).

**CONSERVATION**

No conservation measures have been implemented. No further housing or road development should take place that could impinge on this butterfly. A management plan and regular monitoring are needed. Liaison between officials of the West Coast National Park, the private consortium that owns the Postberg Nature Reserve and the Lepidopterists' Society of Africa is needed. Searching for further habitats is required.

*Thestor brachycerus* (Trimen, 1883)

**Type locality** [SA: WC]—'Cape Colony (Western Districts)'.

**Common name** Knysna Skolly.

**Distribution** SA: WC.

**ECOLOGY**

**Habitat** The nominate subspecies is found in coastal Fynbos. *Thestor brachycerus dukei* occurs in montane Fynbos.

**Habits** They are colonial, circling about rapidly and settling on the ground or on rocks.

**Flight period** October to February.

**Early stages** Clark & Dickson (1971: 257, plate 120); Clark & Dickson (1971: 259, plate 122). Larval food: probably some substance obtained during association with ants (Clark & Dickson 1971: 257). Associated ant: nothing published.

### *Thestor brachycerus brachycerus* (Trimen, 1883)

**Type locality** [SA: WC]—'Cape Colony (Western Districts)'.

**Common name** Knysna Skolly, Knysna-skollie (A).

**Status** Critically Endangered [CR B2ab(i,ii,iii)].

**Distribution** SA: WC—Knysna.

**ECOLOGY**

**Range & population** Two small populations, each about 6 000 m<sup>2</sup> in size, remain near the Eastern Head of the Knysna lagoon. There are probably less than 200 adult specimens per season, based on population counts.

**Habitat** North-, northeast- and northwest-facing slopes covered with Knysna Sand Fynbos (Mucina & Rutherford 2006), with low vegetation and open sandy soil (Edge 2005). The underlying geological formation is Table Mountain Sandstone. The species used to have a much wider range in and around Knysna (J. Ball, pers. obs. over 42 years). Historically, the taxon would have coped with low-intensity grazing by various ungulates. Low-intensity bovine grazing can approximate this situation. The habitat changes caused by the high-intensity grazing of sheep are not conducive to the sustainability of this insect (Edge 2005).

**Habits** Trimen, who described the species in 1883, says that 'they settle on the bare ground, and I often used to find them sitting on the heaped-up dust of the wagon-roads, to which they would return after being roused by the passing vehicles'. The flight is fairly weak.

**Flight period** December and January.

**Early stages** The first instar larva was recorded by Clark & Dickson (1971). Larval food: probably some substance obtained during association with ants and is probably obtained by trophallaxis (Clark & Dickson 1971). Associated ant: nothing published.

**RATIONALE**

Currently known only from two small localities in the Pezula Golf Estate (previously Sparrebosch), near

Knysna. The species was listed as Indeterminate in S.F. Henning & G.A. Henning (1989) and subsequently Red-Listed as Rare in G.A. Henning & S.F. Henning (1995). This taxon has very narrow habitat specificity, a small geographic range and low abundance. The population trend has been declining since the 1960s (J.B. Ball, pers. obs.) and more rapidly since 1989. Heath & Pringle (2004) have included the former *Thestor dukei* as a subspecies of this butterfly. The latter is a widespread taxon found in the mountains to the west in the Western Cape Province.

**THREATS**

The remaining localities inhabited in the Knysna vicinity are threatened by loss of habitat and by housing developments (Edge 2005). Incremental habitat loss and fragmentation is caused by ongoing housing and road development, golf course development and excessive grazing, particularly of late by sheep. Seven strong colonies have gone extinct in the general area since 1962. Historically, plantation forestry has also eradicated a number of localities southeast of Knysna. The habitat threats, both past and present, embody and illustrate the process of landscape attrition (Hunter 1996). The ecosystem status of the habitat, from a vegetation perspective, is Endangered (Rouget *et al.* 2004).

**CONSERVATION**

Two small colonies are currently found in the Pezula Golf Estate. A few colonies went extinct as a result of this development. No conservation measures are in force apart from the undertaking by developers not to disturb known localities (Edge 2005). Such an approach is to be commended and, if applied, reflects a recent paradigm shift by some developers towards butterfly conservation.

### *Thestor protumnus* (Linnaeus, 1764)

**Type locality** [SA: WC]—'Tulbagh, Cap. b. Spei'.

**Common name** Boland Skolly.

**Distribution** SA and Namibia.

**ECOLOGY**

**Range & population** Western Cape, Northern Cape and Free State. There are three subspecies, only one of which is threatened.

**Habitat** Nominate in Fynbos and the other two subspecies in Karoo.

**Habits** Colonial, sometimes occurring in large numbers. Males establish territories on bare patches of ground, flying around rapidly and settling on the ground.

**Flight period** October to January.

**Early stages** Clark & Dickson (1960: 278); Clark & Dickson (1971: 252, plate 118). Larval food: coccids

(Hemiptera: Coccidae) (Clark & Dickson 1960: 278; in captivity); *Ceroplastes* species (Coccidae) (Dickson & Kroon 1978: 89). Associated ant: nothing published.

### *Thestor protumnus terblanchei* S.F. Henning & G.A. Henning, 1993

**Type locality** SA: [FS]—'Mooimeisieshoek, Korannaberg, Orange Free State'.

**Common name** Terblanche's Skolly, Terblanche-skollie (A).

**Status** Vulnerable [VU C2b; D1+2].

**Distribution** SA: FS—known only from the type locality at Korannaberg.

#### ECOLOGY

**Range & population** This butterfly has an area of occupancy smaller than 10 km<sup>2</sup>. The adult population numbers vary between years. The total annual population probably does not exceed 500 individuals and may be considerably less, based on population counts.

**Habitat** Inhabits dry karoo-type vegetation at the base of and in gullies on the southwest-facing slope of the Korannaberg. The vegetation type is Eastern Free State Clay Grassland in the Grassland Biome Unit (Mucina & Rutherford 2006).

**Habits** The insect inhabits an open locality with sandy patches and low bushes. All known *Thestor* larvae appear to be aphytophagous and myrmecophilous. Further research, coupled with investigation for further populations, is needed.

**Flight period** January to March.

**Early stages** Nothing published.

#### RATIONALE

Only one locality of *Thestor protumnus terblanchei* is known. The numbers of individuals seem to fluctuate on an annual basis and very few specimens are normally seen. No habitat management plan is in place to conserve this subspecies. It was not included in S.F. Henning & G.A. Henning (1989), but was included (as *T. terblanchei*) in G.A. Henning & S.F. Henning (1995). Heath & Pringle (2004) gave the taxon subspecific status. The nominate subspecies and the subspecies *T. protumnus aridus* are widespread and common.

#### THREATS

The locality is at the very edge of the Karoo and the habitat can easily be modified by small weather changes brought about by global warming. There are no immediate threats, but the habitat could easily be unsuitably modified by agricultural activity. This is a 'narrow habitat endemic' so ecological risk factors have to be considered well beyond mere locality preservation. The ecosystem status of the habitat, from a vegetation perspective, is Endangered (Rouget *et al.* 2004).

#### CONSERVATION

No specific conservation measures are in place. A management plan, coupled with the co-operation of the owner of the farm Mooimeisieshoek, is needed.

### SUPERFAMILY Hesperioidea

#### FAMILY HesperIIDae

#### SUBFAMILY Heteropterinae

#### GENUS *Metisella* Hemming, 1934

An Afrotropical genus of 22 species.

### *Metisella meninx* (Trimen, 1873)

**Type locality** [SA: NW]—'Potchefstroom, Transvaal Republic'.

**Common name** Marsh Sylph, Moeraswalsertjie (A).

**Status** Vulnerable [VU A3ce].

**Distribution** SA: M—suitable wetlands in the western montane areas; NW—Potchefstroom, Hartbeesfontein; G—suitable wetlands; KZN—suitable wetlands in the far northwestern parts; Free State Province—found only in the northern extreme of the province along the Vaal River. There was an erroneous record from Angola (Evans 1937). There are fewer than 20 known subpopulations.

#### ECOLOGY

**Range & population** Adults can be found in numbers in suitable marshy habitats in good years. May be absent from suitable sites for a number of years before being reintroduced from core populations (G.A. Henning & Roos 2001). No quantitative data on the population dynamics have been published.

**Habitat.** This species inhabits marshes in wetlands at altitudes of 1 400 to 1 700 m. The marshes are often in the headwaters of streams (G.A. Henning & Roos 2001). Found in marshland (vleis), in open grassland of a number of Bioregions in the Grassland Biome Unit (Mucina & Rutherford 2006).

**Habits** Males establish territories around clumps of the food plant in marshes (G.A. Henning & Roos 2001).

**Flight period** November to March.

**Early stages** The larval host plant, rice grass, *Leersia hexandra* Sw. (Poaceae) was determined by G.A. Henning & Roos (2001). The eggs, as well as aspects of the early stages, were also recorded for the first time by them. The pupa remains unrecorded at present.

#### RATIONALE

More localities of this butterfly species have been found in recent years, especially since its importance was highlighted by S.F. Henning & G.A. Henning (1989). However, many localities where *Metisella meninx* has been found previously, have been lost (S.F. Henning & G.A. Henning 1989). The open wetlands in

the grasslands of the highveld of South Africa, where subpopulations of the species are present, are under tremendous pressure from urban developments—residential, recreational and industrial—and to a lesser extent agriculture. The listing of *M. meninx* as Vulnerable is a consequence of the rapid decline in the area of occupancy, accompanied by the invasion of alien trees and pollution at many localities, which has resulted in a modification of marshland habitat since 1989. Subpopulations are fewer, with smaller numbers of adults. Formerly listed as Indeterminate in S.F. Henning & G.A. Henning (1989) and also in G.A. Henning & S.F. Henning (1992b). This taxon has relatively narrow habitat specificity, a large geographic range and a relatively low abundance.

### THREATS

*Metisella meninx* is a marsh species that requires thick clumps of the grass *Leersia hexandra* Sw. (Poaceae) and an unpolluted environment. A marsh habitat is one of the most easily disrupted habitats and the apparent plight of this species brings this sharply into focus. In recent times many of the marshy localities occupied by *M. meninx* in Gauteng have been destroyed. The primary cause of habitat loss is ongoing destruction or degradation of wetlands, caused by urbanisation and agricultural activity. More than a third of South Africa's wetlands have been destroyed (Breen & Begg 1989). This has been particularly prominent in Gauteng (Lawrence *et al.* 1999; Henning & Roos 2001). More difficult to assess are the effects of habitat degradation and fragmentation on population migration and recruitment (metapopulation dynamics) and ecosystem functioning. The effects of fire frequency, global warming and pollution (including acid-rain caused by various industries on the highveld) on these habitats (and in particular on the larvae) are also unknown. The continued efforts of lepidopterists are vital in obtaining the necessary ecological and distributional data. Searches for further localities are needed.

### CONSERVATION

A recent extension to the Suikerbosrand Nature Reserve in Gauteng has incorporated part of one of the known colonies. Terblanche (pers. comm.) found another locality at Sedhaven Dam within the Suikerbosrand Nature Reserve with good numbers one year. However, a student, L. Roux, who is busy with a project about the flight patterns of *Metisella meninx*, found that the colony at the Sedhaven Dam may be very unstable—no *M. meninx* have been recorded despite regular surveys in 2005 and 2006. This shows that much research remains to be done to find core versus sink populations of *M. meninx* and that judging the distribution of the butterfly species by using only locality records may be misleading. The butterfly has been rediscovered by R.F. Terblanche and A. Laas (pers. comm.) at the O.P.M. Prozesky Reserve in Potchefstroom. It is hoped that this finding will lead to conservation of the remains of the type locality, but the implementation of a habitat management programme has to be initiated. Although not yet endangered, this species should be closely

monitored so that preventative measures to possible threats can be taken timeously. The significant decline in suitable habitat puts the taxon at risk and requires increased monitoring and data collection. Liaison with local provincial conservation authorities, wetland ecologists, road engineers and farmers is necessary, so that they can be made aware and act accordingly.

### SUBFAMILY Hesperinae

#### GENUS *Kedestes* Watson, 1893

An Afrotropical genus of 24 species.

#### *Kedestes barberae* (Trimen, 1873)

**Type locality** [SA: EC]—'Stormbergen, Cape Colony'.

**Distribution** Zambia, Zimbabwe, SA, SW and L.

### ECOLOGY

**Range & population.** There are three subspecies, only one of which is threatened. Nominotypical *Kedestes barberae* has a large extent of occurrence, being found in the Eastern Cape, KwaZulu-Natal, Lesotho, Free State, Gauteng, Mpumalanga, Limpopo and eastern Zimbabwe. The isolated subspecies *K. barberae bonsa* (with two separate white lines on the undersurface of the hind wing) is found in the northern Eastern Cape and southern Free State.

**Habitat** Grassland over the eastern montane areas of South Africa and grass among Fynbos in the case of the Western Cape population.

**Habits** A montane species, which flies swiftly around the grassy patches of food plant. It settles on grass to rest.

**Flight period** September to November.

**Early stages** Clark in Dickson & Kroon (1978: plate 23). Larval food: *Imperata cylindrica* (L.) Raesch. (Poaceae) (Pringle *et al.* 1994).

#### *Kedestes barberae bunta* Evans, 1956

**Type locality** [SA: WC]—'near Steenberg Railway Station, Cape Province'.

**Common name** Barber's Cape Flats Ranger, Barberkuschwagttertjie (A).

**Status** Critically Endangered [CR A2ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v); D].

**Distribution** SA: WC—Cape Flats on the Cape Peninsula.

### ECOLOGY

**Range & population** *Kedestes barberae bunta* is currently known only from two localities on the Cape Flats, near Cape Town, in the Western Cape. The type locality near the Steenberg railway station in Retreat was destroyed by housing development. The

last specimens in this locality were recorded in 1947 (Dickson & Kroon 1978). Two other small localities (metapopulations) were known near Strandfontein, 8 km east of the type locality near Steenberg railway station. This was east (smaller population) and west (larger and stronger population) of the junction between the M17 and R310 roads. This isolated coastal race had previously never been seen in the nearby Rondevlei, Zandvlei or Driftsands Reserves. The total area of possibly suitable stands of *Imperata cylindrica* (L.) Raeusch. (Poaceae) in seeps near the tiny present Strandfontein locality and adjacent areas was found to be smaller than 0.1 km<sup>2</sup> (Allan 2004). This comprised 33 stands in 11 study sites. The vagility of the adult butterfly is not known. The currently known habitat of this taxon (east of the M17) has an area of occupancy of about 0.001 km<sup>2</sup> (Allan 2004).

There would clearly have been metapopulation movement of the adult in the past. Fifteen years ago J. Ball noted about 40 adult specimens at the two Strandfontein localities. The flight period was from early September to the middle of October. Near Strandfontein only, *Kedestes barberae bunta* has occurred in the same small habitats as *K. lenis lenis* in the past. The latter has a slightly different phenology and a slightly larger range than the former.

**Habitat** The habitat of this narrow Cape Flats endemic consists of stands of *Imperata cylindrica* (L.) Raeusch. (Poaceae) (Gibbs Russell *et al.* 1991), growing in damp seeps between dunes. This is predominately in coastal Strandveld vegetation (with mosaicism of dune thicket and Sand Plain Fynbos (Low & Rebelo 1998) or Acocks Veld Type 47 (Coastal Macchia or Fynbos) (Acocks 1988), at an altitude below 10 m (Pringle *et al.* 1994; Claassens 2000; Allan 2004). The vegetation type is now called Cape Flats Dune Strandveld (Mucina & Rutherford 2005). The sandy soil where the butterfly is found, is mainly alkaline, calcareous soil (Allan 2004).

**Habits** The adult skippers are seldom found far from the larval host plant, cottonwool grass, *Imperata cylindrica* (L.) Raeusch (Poaceae). This grass usually only flowers after fire. The very wise use of fire is needed to maximise the ecological availability of the host plant. *I. cylindrica* occurs from Cape Town to central Africa and Asia (Bond & Goldblatt 1984). This skipper, however, occurs only in a very small winter-rainfall location, in damp seeps (winter and early summer) between dunes. *Geranium incanum* Burm.f. (Geraniaceae) appears to be an important nectar plant for the adult skippers.

**Flight period** September and October.

**Early stages** Unrecorded.

## RATIONALE

Only one viable locality of *Kedestes barberae bunta* appears to be left at Strandfontein on the Cape Peninsula. Most of its other habitats on the Cape Flats north of Table Mountain have been destroyed

(Claassens 2000). The Cape Flats is a unique ecosystem between Table Mountain and the Cape Fold Mountains to the north and east. The natural vegetation and habitats in this area have been almost totally destroyed by urbanisation, alien invasive species, especially *Acacia saligna* (Labill.) H.L.Wendl. (Fabaceae), and agriculture. The decline in suitable habitats as well as in the numbers of this subspecies is a reflection of the poor conservation of the Cape Flats. *K. barberae bunta* faces extinction in the near future if no conservation action is taken. There has been a precipitous declining population trend over the last 15 years, as well as dramatic incremental deterioration of quality habitat since 1989. Two adult specimens were seen in 2002 and one in 2004. This subspecies was not previously listed in a Red Data Book or Red List. The combination of narrow habitat specificity, a tiny geographic range, with the last known population split by a municipal road, and a very low abundance adjacent to an urban environment, is cause for great concern.

## THREATS

Suitable habitats on the Cape Flats have been systematically destroyed. Threats to the remaining localities are habitat destruction, housing developments and alien vegetation. A few synchronous factors have conspired to place this taxon on the brink of extinction. The major components are: urban development with incremental habitat fragmentation and loss of habitat connectivity, invasive alien vegetation encroachment, mainly Port Jackson willow, *Acacia saligna* (Labill.) H.L.Wendl., and *rooikrans*, *A. cyclops* A.Cunn. ex G.Don (Fabaceae) and increased fire frequency (the pupae and larvae remain on the *Imperata* food plant and are not fire-adapted as are many lycaenids) and fire intensity. There is the possibility of further housing development and possible road construction (M3 toll road extension) in the general region of the currently minute and fragmented habitats (Allan 2004). There has been virtually no suitable food plant grass on the western side of the Strandfontein site for a few years owing to too frequent fires.

Warmer summers with increasingly dry winter and spring seasons, with greater and earlier drying of the seeps of adequate quality (aggravated by transpiration of alien vegetation), may also be a factor. In the nearby Driftsands area, residents of informal settlements regularly burn the grass to produce new grazing for livestock. Dumping of refuse degrades some of the habitats. There has been unsavoury social behaviour and criminal activity among the alien vegetation at the Strandfontein site and this possibly may also have led to annual burning of the habitat. The ecosystem status of the habitat, from a vegetation perspective, is Endangered (Rouget *et al.* 2004).

## CONSERVATION

Research is currently being undertaken by Cape Nature Conservation to assess its conservation status. No conservation measures have been implemented at the last known habitat at Strandfontein. The remaining

suitable *Imperata* sites (Allan 2004) (probably more beneficial to *Kedestes lenis lenis*) should preferably be cleared of alien vegetation. Small mosaic block burns at greater intervals should occur. Fencing the area in the present political milieu may prove fruitless, but would be a useful first step. Connectivity of suitable habitat should be encouraged through an alien-free green belt of vegetation adjacent to the major arterial roads. Development should be done in conjunction with a conservation management plan and ongoing effective implementation. Only 0.05 km<sup>2</sup> of apparently suitable *Imperata* habitat falls within reserves in the general area, these being Rondevlei Nature Reserve (a municipal reserve) and the Driftsands Nature Reserve (Cape Nature Conservation) (Allan 2004).

### *Kedestes lenis* Riley, 1932

**Type locality** [SA: WC]—‘Cape of Good Hope’.

**Distribution** SA: WC—on the Cape Flats; EC, KZN and FS—eastern montane grasslands.

#### ECOLOGY

**Range & population.** There are two subspecies, only one of which is threatened. *Kedestes lenis alba* (G.A. Henning *et al.* 1997) has a disjunct extent of occurrence, being found in high mountains of the Eastern Cape, KwaZulu-Natal, Lesotho and the Free State. The isolated nominate subspecies is found on the Cape Flats in the Western Cape.

**Habitat** Grassland in the high montane areas and grassland in Fynbos in the case of the Western Cape population. Most often found along stream banks and in marshy places, from sea level to 1 800 m.

**Habits** A montane species that flies swiftly around the grassy patches of food plant. It settles on grass to rest. It is seldom found far from its larval food plant.

**Flight period** October to March.

**Early stages** Nothing has been published on the early stages. Larval food: *Imperata cylindrica* (L.) Raesch. (Poaceae).

### *Kedestes lenis lenis* Riley, 1932

**Type locality** [SA: WC]—‘Cape of Good Hope’.

**Common name** False Bay Unique Ranger, Valsbaai-wagtertjie (A).

**Status** Endangered [EN A2ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v); D].

**Distribution** SA: WC—Strandfontein (east of Muizenberg); near Retreat (Feltham).

#### ECOLOGY

**Range & population** The larval food plant is cottonwool grass, *Imperata cylindrica* (L.) Raesch. (Poaceae). This plant, paradoxically, has a very wide distribution (Bond & Goldblatt 1984). The larval food plant is fire-adapted, but the butterfly is not. The adult skippers are intimately associated with the

damp seeps where their larvae feed. The total area of suitable *I. cylindrica* stands remaining in its former range on the Cape Flats in Cape Town is now just smaller than 0.1 km<sup>2</sup> (Allan 2004). This is the known larval area of occupancy. The adults are seldom found away from the host plants, with apparent poor vagility (J. Ball, pers. obs.). The possible range of this skipper is currently 33 small stands in 11 areas that are in fairly close proximity (Allan 2004). *Kedestes lenis lenis* is currently known to occur only in or close to two small municipal nature reserves (Zandvlei and Rondevlei) as well as at three tiny localities in Strandfontein (near the intersection of Strandfontein and Spine Roads). There has been a significant decline in the numbers of adults seen over the last 15 years. There appear to be two very small subpopulations.

**Habitat** Damp seeps, containing stands of cottonwool grass, *Imperata cylindrica* (L.) Raesch. (Poaceae) (Gibbs Russell *et al.* 1991), between dunes on the southwestern portion of the Cape Flats near Cape Town. The vegetation type is Cape Flats Dune Strandveld (Mucina & Rutherford 2006).

**Habits** The adults are seldom found away from the host plants. An important nectar source is *Geranium incanum* Burm.f. (Geraniaceae).

**Flight period** November and December.

**Early stages** Unrecorded.

#### RATIONALE

As in the case of *Kedestes barberae bunta*, only one viable locality of *K. lenis lenis* appears to be left at Strandfontein on the Cape Peninsula. Most of its other habitats on the Cape Flats north of Table Mountain have been destroyed (Claassens 2000). *K. lenis lenis* faces extinction in the near future if no conservation action is taken. The taxon used to be common and more widespread, but has disappeared from many of its former sites and is now known from only five very small localities. Two of them are in a reserve. This skipper was not included in S.F. Henning & G.A. Henning (1989). It has narrow habitat specificity, a small geographic range and a low abundance at present. There has been a declining population trend since 1989. The subspecies *K. lenis alba*, with white markings on the anterior surface of the palpi and a more ochre-brown coloration on the undersurfaces of the wings, is found at high altitude in the Eastern Cape, KwaZulu-Natal, Lesotho and the southern Free State. This latter race is not currently threatened.

#### THREATS

Suitable habitats for the nominate subspecies on the Cape Flats have been systematically destroyed. Threats to the remaining localities are habitat destruction, housing developments and alien vegetation. These threats are multiple and synergistic, including loss of habitat principally due to urban development with subsequent habitat fragmentation, invasive alien trees, especially *Acacia saligna* (Labill.) H.L.Wendl. and *A. cyclops* A.Cunn. ex G.Don (Fabaceae), increased fire frequency and intensity (including burning for grazing)

and dumping of refuse. A major arterial road runs between two Strandfontein localities, with a possible new road development in the vicinity. Present climate warming coupled with less winter/spring rainfall may also be a threat. The effect of increased water extraction from boreholes in the general area may or may not be a synergistic factor. The ecosystem status of the habitat, from a vegetation perspective, is Endangered (Rouget *et al.* 2004).

### CONSERVATION

Research is currently being undertaken by Cape Nature Conservation to assess its conservation status. No conservation measures have been undertaken at the three very small Strandfontein sites. Very small colonies are present in the Rondevlei and Zandvlei municipal reserves, where the conservators are keenly aware of the plight of this insect (and *Kedestes barberae bunta*). Population levels have to be monitored regularly. The planning authorities should be made aware of the extreme threat to these two taxa. Crucial to the recovery of the insect is the removal of invasive alien vegetation in and around its remaining habitats. A planned management strategy, including a fire regime maximising the ecological requirements of *Imperata cylindrica* (L.) Raeusch. (Poaceae) and the two *Kedestes* taxa, also has to be implemented and maintained.

### GENUS *Platylesches* Holland, 1896

An Afrotropical genus of 20 species.

### *Platylesches dolomitica* S.F. Henning & G.A. Henning, 1997

**Type locality** SA: M—'South Africa: 30 km south-east of Steelpoort, Lydenburg District, Mpumalanga'.

**Common name** Dolomite Hopper, Dolomiet-hoppertjie (A).

**Status** Vulnerable [VU D2].

**Distribution** SA: M—Steelpoort; G—Carletonville, Hillshaven, Magaliesberg and Pretoria.

### ECOLOGY

**Range & population** A species that apparently flies early in the season, there are very few records, even from known localities. Known from the type locality, 30 km southeast of Steelpoort in Mpumalanga and near Carletonville and Hillshaven in Gauteng. Records from Pretoria and Magaliesberg require confirmation.

**Habitat** Dolomite ridges in Sour Highveld Grassland, Rocky Highveld Grassland and Moist Cool Highveld Grassland. As far as is known, this taxon is an early season (August to October) habitat specialist of dolomite ridges in bushveld. Noted in Gauteng Shale Mountain Bushveld near Carletonville and Hillshaven, and Ohrigstad Mountain Bushveld in the Savanna Biome Unit (Mucina & Rutherford 2006).

**Habits** At both localities this skipper was noted to occur sympatrically with *Platylesches ayresii* (Trimen

& Bowker 1889) and *P. neba* (Hewitson 1877). These butterflies are very fast and elusive. M.C. Williams captured a single male while it was feeding from the flowers of an asteraceous herb on the southern slopes of a hillside about 1 km west of Hillshaven.

**Flight period** August to October.

**Early stages** Nothing has been published on the early stages. Larval food: Suspected to be *Parinari capensis* Harv. (Chrysobalanaceae). The plant has been recorded at both sites but has not been confirmed as the larval food plant.

### RATIONALE

This species may easily be overlooked and occurs in the Mpumalanga and Gauteng Provinces. It may therefore seem appropriate to list *Platylesches dolomitica* as Data Deficient. However, the species appears to be confined to dolomite ridges, has a very patchy distribution, and a very restricted area of occupancy. The ecological integrity of many dolomite ridges is threatened by urbanisation and mining activities in South Africa. This species has narrow habitat specificity, a large geographic range and very low abundance. There appears to have been a declining population trend since its taxonomic description in 1997. Owing to the small numbers seen, this could be more apparent than real. We do not know how many subpopulations are involved. Very little is, in fact, known about this taxon. This includes the larval host plant. The adults are extremely wary and fast on the wing. The known localities are linked by the presence of dolomitic ridges. Holoendemic plants (habitat specialists confined to a small area owing to an isolated or special habitat) are often associated with an unusual substrate, such as dolomite (Richardson 1978). Little study on the invertebrates of such regions has been done in South Africa. Autecological and synecological studies of this species and its specialised habitat are needed. This taxon was not known when S.F. Henning & G.A. Henning (1989) was compiled and it was also not listed in the subsequent Red List updates.

### THREATS

Research during the flight period over several seasons from 2001 to 2006 have not resulted in any specimens being recorded from the Carletonville sites. The species seems to be found in isolated pockets. The one at Carletonville is threatened by habitat modification. This site is possibly threatened by habitat change due to airborne pollution. Many large mines are found in the vicinity. Further research is needed. The ecosystem status of the habitats, from a vegetation perspective, is Endangered (Gauteng) and Vulnerable (Mpumalanga) (Rouget *et al.* 2004).

### CONSERVATION

No conservation measures are in force or have been implemented. In many respects information on this insect is deficient. Considerable effort is needed to obtain more data on its life cycle, ecology, population and distribution.



# A framework for conservation management of South African butterflies in practice

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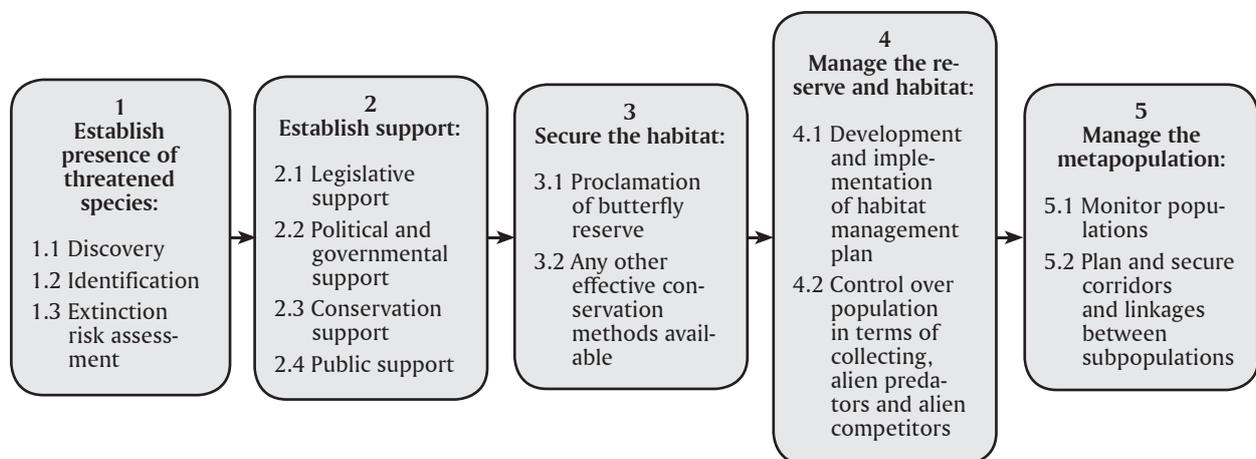
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The present revised Red Data Book of South African butterflies contains not only a list of extinct and threatened species but also a wealth of information gained from the experience of many butterfly enthusiasts over more than three centuries. In addition, recent more focused research on the ecology of threatened species in South Africa has contributed substantially to our understanding of the conservation of these threatened taxa. But how can the conservation of these butterfly species take place in practice, based on the information presented in a Red Data Book and Red List? To answer this question a framework that applies to the conservation of, and research on, threatened butterfly species in South Africa is presented here. It is hoped that this framework can serve as a useful management tool that links conservation actions and research efforts and provides a more systematic approach in reaching conservation targets for a given taxon.

A flowchart of the steps needed for the successful conservation of threatened species is given in Figure 1. The chart can be used as a checklist for the conservation of each of the threatened butterfly taxa given in the Red

Data Book. For the sake of simplicity the steps are in linear sequence and appear to end at Step 5. In practice this process is integrative and based on continuous re-evaluation and correction.

Obviously, the first step is to be aware of a threatened butterfly taxon, i.e. to establish its presence (Figure 1). Exploration by entomologists in both the formal and informal sectors is essential in discovering populations of threatened butterfly taxa. The identification of some threatened taxa can be problematic in terms of available diagnostic characters and in terms of differing opinions about the taxonomic status of these characters. With regard to diagnostic characters and the identification of taxa, a panel of experts should be available from the Lepidopterists' Society of Africa, and also from national museums and universities, to assist or support conservation authorities in the identification of threatened butterfly taxa. Even with a field guide and a Red Data Book in hand, it may still be difficult for the overburdened conservation officer to identify a particular species. Short identification courses on threatened butterfly species, based on



**Figure 1.**—Flowchart of the basic steps needed to secure and manage a threatened butterfly species. Note: To establish the extent of metapopulations, more subpopulations have to be discovered, returning the process to the first step.

Red Data Books or suitable identification guides, are recommended on a regional basis. Taxonomic research could make substantial contributions to the conservation of threatened butterfly taxa in three ways. Firstly, an effort should be made to produce an ever more stable and accepted taxonomy at the specific and infraspecific levels by making use of as many applicable techniques as possible. Secondly, the biological information that is obtained during taxonomic and other investigations should be made available to the conservation sector and other disciplines. Thirdly, but not least importantly, taxonomic research should be directed at finding the most user-friendly diagnostic characteristics for a threatened taxon (species or subspecies). In practice, the state of the taxonomy of butterfly species at the specific and infraspecific levels may affect conservation priorities as well as the success of butterfly conservation in South Africa. Taxonomic research is far from outdated and is of fundamental value in this conservation process.

In addition to the role of discovery and identification in the first step (Figure 1), the risk of extinction must be established and presented to conservation authorities. This is one of the major purposes of the present work. This extinction risk assessment is dealt with throughout this Red Data Book and is presented here to complete the first step of establishing the presence of threatened taxa. The regional lists provided in this book serve to inform conservation authorities and environmental impact assessment (EIA) consultants of possible Red-Listed butterfly taxa in each province. This is achieved by means of the Red-Listing effort, with close co-operation between the Lepidopterists' Society of Africa, other associations concerned with wildlife conservation and entomology, researchers and conservation authorities. Red Data Books are very important tools that communicate the status of threatened species, especially if the additional information on threats, reasons for Red-Listing of the species, taxonomy and ecology are also taken into account. Fortunately, the recent IUCN (2001) categories not only allow for the present more objective extinction risk assessments, but also for the incorporation of more quantitative data in the future.

Without legislative, governmental and public support the conservation of threatened butterflies will be less effective, even if detailed knowledge on their biology is available (Figure 1, Step 2). The foundation for the conservation of a threatened butterfly taxon is the legal standing and the priority such a taxon receives from national and regional conservation bodies, i.e. the provincial conservation authorities in the case of South Africa. This does not mean that threatened butterfly taxa that appear on protected lists are, in fact, protected—the new addition to the extinct category in this revised Red Data Book, *Lepidochrysops methymna dicksoni*, has been on a protected list since 1976, but in vain. The key to the conservation of threatened butterfly species in South Africa remains habitat conservation and the conservation of metapopulations. Legislation should facilitate rather than limit the valuable role that the amateur lepidopterist plays in adding new distribution records. In turn, the amateur lepidopterist should make every effort to explore new areas, apart from monitoring

butterflies at well-known localities (Terblanche & Van Hamburg 2003). In summary, achieving the second step (Figure 1) requires close and goal-directed communication and co-operation between a number of parties, including the Lepidopterists' Society of Africa, other conservation and research societies, law-makers, environmental managers, the governmental conservation departments and the private sector.

The third step requires that the habitats of threatened butterfly species, especially in the critically endangered and endangered categories, be formally secured. Judging from experience gained in South Africa, the best means of securing the habitat is to proclaim it as a butterfly reserve. These butterfly reserves often serve as conservation areas for other fauna and flora. For example, at the Alice Glockner Nature Reserve in Gauteng, proclaimed to conserve *Chrysoritis aureus*, a number of plant species of particular conservation importance are conserved together with the butterfly. At present it is not clear whether the conservation of habitats on private ground, or through heritage programmes, will lead to the successful long-term conservation of an endangered or critically endangered butterfly. The latter programmes have been in existence for some time now and deserve to be evaluated in the near future. Securing the habitats of rare and threatened butterfly species, rather than the individual insects, is essential because they are remarkably habitat-specific and cannot survive in a number of biotopes as is often the case with some of the large, rare vertebrates. In such a secure environment, specifically set aside for the threatened butterfly species, populations can be regularly monitored, and the habitat managed, under controlled conditions.

Since the conservation of specific habitats is so important for threatened butterfly species, urban development poses a prominent threat to many rare butterfly species in South Africa (see above for a checklist of threats). Our planet is faced with an ever increasing human population and as countries develop, increasing urban sprawl is inevitable. Urban development is often accompanied by extensive invasion of habitats by alien plant species, which leads to further habitat loss. Field studies by specialist biologists have fortunately become an integral part of the EIA process in the hope of conserving high-priority areas and in an attempt to stem the tide of extinctions. The EIA process is backed by legislation, the Biodiversity Act of 2004, which aims to conserve the indigenous biodiversity heritage of South Africa. More research is necessary to improve and streamline the use of studies by biologists in the EIA process. The relevant expertise and the professional profile of such specialists also deserves more recognition. Field experience and appropriate knowledge of habitats are essential requirements for invertebrate specialists who investigate areas for which developments are proposed. Threatened butterfly species are often only on the wing for a short period in any given year. For example, adults of *Lepidochrysops praeterita* (the Highveld Blue) fly for about three weeks in September. An EIA that happens to be conducted in habitat occupied by *L. praeterita* during any month

other than September will not record the presence of the butterfly. However, a knowledgeable biologist may suspect the presence of taxa with a short flight period and recommend follow-up surveys where they are deemed necessary.

If a region, such as a province in South Africa, has a database with information about threatened species, the EIA process could be informed proactively of the possible threatened species in an area. Integrated programmes that make use of the expertise of conservation authorities, butterfly specialists and ecological consultants, have already been initiated in South Africa with success, for example:

- (1) In the Gauteng Province, Henning, Roos and Forsyth constructed a regional database in 2004, in accordance with the 'C-plan', to advise authorities on the real and possible distributions of threatened butterfly species.
- (2) In the Gauteng and the Western Cape Provinces, consultations led to the discovery of important localities of threatened species and of taxa that are possibly new to science (Edge 2005a; Terblanche & Edge 2007).
- (3) An informative database was used to model possible habitats for threatened species in KwaZulu-Natal Province and is being used as a management tool (Armstrong 2002).

Securing the habitat of a threatened butterfly taxon is only a single step in the process of securing the future of the butterfly. The fourth step, management of the habitat, is of crucial importance for the long-term survival of threatened butterfly species (Figure 1, Step 4). Despite this undoubted importance, there are only a few detailed habitat studies and even fewer studies for the establishment of habitat management plans for threatened butterfly species. The conservation of rare butterfly species requires a paradigm shift from passive low-key management to the dynamic application of continuously monitored and researched habitat management plans. Detailed habitat management plans for threatened butterfly taxa fall outside the scope of Red Lists and Red Data Books. A habitat management plan, for example the one being developed for *Chrysothrix aureus* (Golden Copper), includes the consideration and application of grassland burning regimes, restoration plans for nearby sites that have been invaded by alien plants, as well as the monitoring of host plants, ant assemblages and the butterfly itself (Henning & Roos 1999, 2000; Terblanche *et al.* 2003). For other species, such as *Orachrysops niobe* (Brenton Blue), different actions, for example the cutting of some vegetation, are needed to manage the habitat (Edge 2002; Edge, Cilliers & Terblanche 2009). This means that different conservation approaches are needed for each species and that, for example, burning should not be seen as a 'quick fix' for creating suitable habitat for threatened species in South Africa. Although detailed habitat management plans are beyond the scope of the present Red Data Book, information on habitat management plans and details concerning the supporting research, should be included in future butterfly Red Data Books.

As a start, references to existing habitat management plans, or the absence thereof, are included for some species in the reviews of threatened species in this work.

The fifth and final step is the management of butterfly metapopulations (Figure 1). Metapopulation biology comprises a number of ecological, genetic and evolutionary considerations that have very important applications in conservation biology (see Hanski & Gilpin 1997). Metapopulations are populations that consist of a number of more or less interconnected subpopulations. Though the genetic resilience of small butterfly subpopulations is poorly understood, many threatened butterfly taxa in South Africa are probably dependent on a metapopulation structure for their long-term survival. The idea that conservation action is only needed when the last known subpopulation of a metapopulation is threatened, is ludicrous and should be abandoned (Terblanche & Van Hamburg 2003). In the medium and long term, species or subspecies of which only one subpopulation at a single location is left, are probably staring down the barrel of the extinction gun. Research and action on possible translocations to suitable or restored habitat become a necessity in order to conserve such taxa.

The monitoring of populations and subpopulations of threatened butterfly taxa is essential if the goals of the fifth step are to be achieved. However, to organise and apply enough manpower to do the monitoring of the 63 threatened butterfly taxa presented in this work will be challenging. This challenge will probably only be met if members of the Lepidopterists' Society of Africa, conservation officers and academics work together. Collecting of specimens for morphological and genetic studies will be necessary. The number of specimens that can be collected without compromising the resilience of the populations deserves research, especially for the critically endangered taxa presented in this book. There may be special cases where butterfly taxa cannot withstand collecting pressures in combination with other threats. In such cases control over collecting will be important but will probably only be successful if such butterfly taxa are already protected within a reserve or in a strictly conserved area. For most threatened butterfly species field work is essential, and should be encouraged, to discover more subpopulations (see Figure 1). So far, trading of threatened butterfly taxa from South Africa, if it exists at all, is not close to the scale of the *Colophon* beetle trade, for which special measures for the collecting of taxa apply. Should a trade in threatened South African butterflies emerge, protected lists and identification guides at customs offices should be considered as important conservation management tools. In general, the study of metapopulations of threatened butterfly species in South Africa is in its infancy and presents an exciting research opportunity.

Management practices relating to the conservation of metapopulations is linked to the spatial connectivity of butterfly populations (Figure 1, Step 5). Corridors and linkages should be secured to allow for genetic exchanges between subpopulations. Research on the population genetics and dispersal behaviours of

threatened butterfly taxa in South Africa would be very valuable as a basis for advising nature conservation authorities on the preservation of corridors and linkages. The width of corridors and linkages also deserves attention (Pryke & Samways 2003; Samways 2005).

A Red Data Book or Red List provides information that is important in all the steps needed to conserve a threatened species in the long term (Figure 1). Ideally, a conservation programme that includes identification of threatened taxa, measures to secure their habitats, and measures to manage their habitats and metapopulations, should be developed and implemented for each threatened taxon presented in this Red Data Book.

Research should be conducted to address these issues and conservation management programmes should be continuously appraised. Appropriate legislation should be enacted to facilitate and support conservation efforts. Finally, the butterfly conservation success stories in South Africa to date were underpinned by essential support from the general public. It is to be hoped that conservation of the threatened taxa presented in this Red Data Book will continue to have the support of South Africans and conservation-minded people across the world, so that this part of our natural heritage, which took millions of years to evolve, will be conserved for future generations.



# Threatened butterflies in South Africa: trends since 1989 and a future perspective

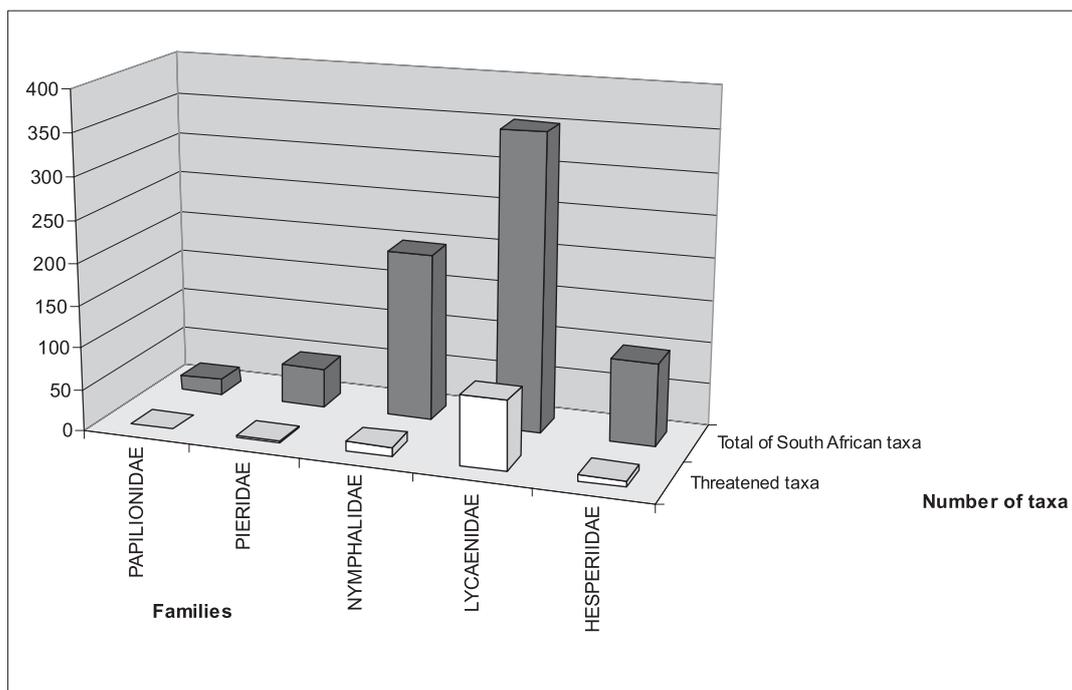
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The first *South African Red Data Book—Butterflies* (S.F. Henning & G.A. Henning 1989) was revised and updated by G.A. Henning & S.F. Henning (1992b) and (1995). For the reasons given below it is not easy to follow trends in the number of threatened butterfly species of South Africa since 1989 to the present:

- (1) A number of butterfly species and subspecies new to science have been described since 1989 and even since the latest update of the South African Red Data Book in 1995.
- (2) The first South African Red Data Book (and its updates) was based on previous categories of threat that were established by the International Union for the Conservation of Nature (IUCN) and World Conservation Monitoring Centre (WCMC). These categories were somewhat subjective and were replaced by the more objective IUCN (2001) categories used in the present analysis. It is therefore difficult to compare trends since the nature of the old and new categories differs to some extent.
- (3) In terms of numbers of threatened species, many marginal species that may be common elsewhere in Africa were included in the first South African Red Data Book (1989). These marginal butterfly taxa are not included in the new Red Data Book.
- (4) The taxonomic ranks of a number of species and subspecies of butterflies that appeared in the first South African Red Data Book have either been sunk from species to subspecies level or raised from subspecific to specific level.



**Figure 2.**—Total number of butterfly taxa in South Africa and total number of threatened species in 1989 when the first Red Data Book of South African butterflies was published.

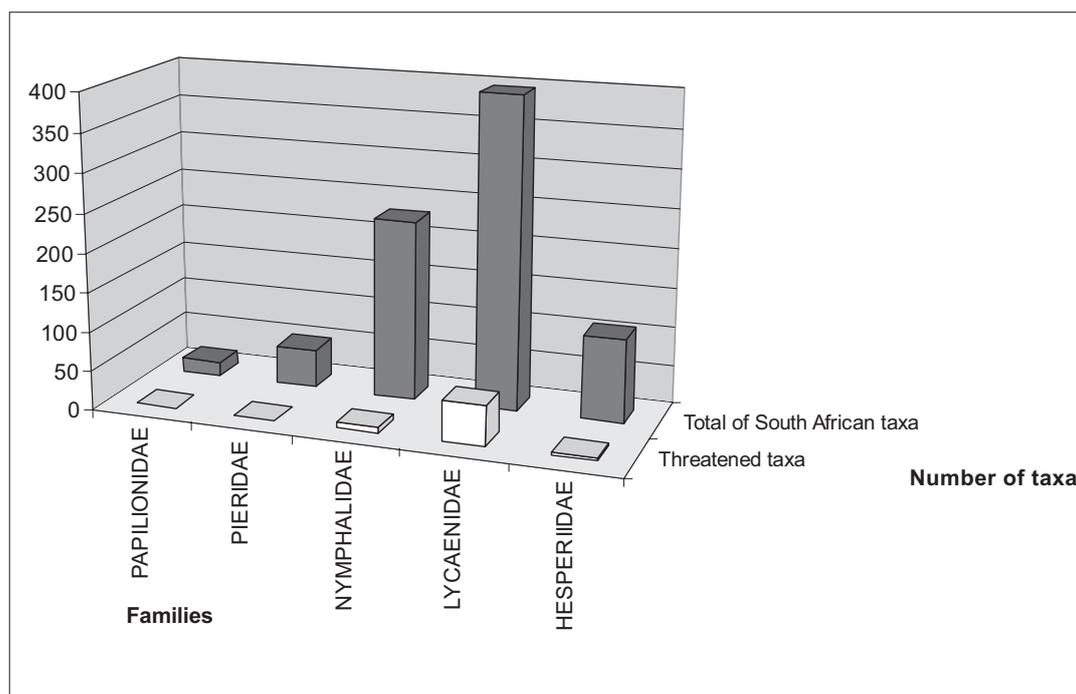


Figure 3.—Total number of butterfly taxa in South Africa and total number of threatened taxa in 2009 included in the revised Red Data Book of South African butterflies.

Despite these impediments some trends, from 1989 to 2009, may be observed and are highlighted here. At the time the first Red Data Book was published, 632 butterfly species were known to occur within the borders of South Africa (S.F. Henning & G.A. Henning 1989). Currently 664 species have been confirmed to be present in South Africa. One alien species, *Pieris brassicae*, was introduced after 1989 and is included in this total. The increase in the number of species in South Africa in recent years is, in part, the result of new discoveries made during explorative collecting trips and is not merely a product of taxonomic revisions. There is no doubt that new species and subspecies still await discovery in South Africa, emphasising the need for continued collecting of this well-known invertebrate group.

South Africa has an unusually large number of subspecies of butterfly. Many of these subspecies occur in the fragmented Forest Biome and others have evolved in different patches of the Fynbos and Succulent Karoo Biomes. Distinguishing characters of the populations of these subspecies are often remarkably constant and they clearly represent both distinct taxonomic entities and evolutionary significant units. For this reason, and because many changes between the specific and infraspecific ranks still take place in South Africa, subspecies were included in the Red-Listing in 1989 and are again included in this work. For the sake of comparing trends in the number of threatened taxa, and their conservation status, it is convenient to compare the number of taxa that comprise the total number of species, as well as additional subspecies of the different sets of data (elsewhere referred to as taxa). According to the database constructed for the comparisons in this Red Data Book, a total of 716 taxa, which include species

and additional subspecies, were known from South Africa when the first Red Data Book on South African butterflies was published in 1989 (Table 7). At present, 801 butterfly taxa (species and additional subspecies) are confirmed within the borders of South Africa (Table 7).

Despite the rise in the number of South African butterfly taxa, the number of threatened taxa has declined from 102 in 1989 to 63 in 2009. The Indeterminate category, utilised in the 1989 version of the Red Data Book, is not included as a threatened category in this comparison, which would have led to an even larger decline in the number of 'Red Data' species. For this analysis the Intermediate category is regarded as similar to the more recent Near Threatened or Data Deficient categories. Overall, the number of threatened taxa has declined from 14.3% to 7.9% of the total number of taxa between 1989 and 2009 (Table 6). This lower percentage, however, is not a function of fewer taxa being threatened, but can, instead, be ascribed to various factors. Firstly, a number of taxa that occur marginally in South Africa, but have a wide distribution further north in Africa, have been removed from the present revised edition. This revised edition addresses global assessments of extinction risk and some of these marginal species may again be considered when regional assessments of extinction risk are addressed in the future. The lower numbers of threatened taxa in the families Nymphalidae, Hesperidae and Pieridae are mainly due to the marginal, subtropical or tropical species that have been removed (Table 3). Secondly, the first Red Data Book included a number of taxa that are now better known in terms of their biology, distribution and threats so that a number of these taxa could be removed from the present Red List. Thirdly, there are instances where the number of threatened species has declined as a result of taxonomic revisions.

Species and subspecies affected by taxonomic revisions should be carefully investigated to make sure that nominal extinctions do not lead to real extinctions.

Some recently described butterflies have been added to the taxa belonging to threatened categories in this revised Red Data Book since they are also believed to be under immediate threat. If the numbers of recently described taxa are taken into account, the decline in number of threatened species compared to the original taxa included in the first Red Data Book of

Table 2.—Total number of South African butterfly taxa (species + additional subspecies) known in the butterfly families in 1989 and 2009 respectively

Families	Total number of taxa: 1989	Total number of taxa: 2009
Papilionidae	19	18
Pieridae	47	49
Nymphalidae	199	230
Lycaenidae	353	397
Hesperiidae	98	107
<b>TOTAL</b>	<b>716</b>	<b>801</b>

Table 3.—Total number of \*threatened South African butterfly taxa (species + additional subspecies) in the butterfly families in 1989 and 2009 respectively

Families	Threatened taxa: 1989	Threatened taxa: 2009
Papilionidae	0	0
Pieridae	2	0
Nymphalidae	11	8
Lycaenidae	82	51
Hesperiidae	7	4
<b>TOTAL</b>	<b>102</b>	<b>63</b>

Table 4.—Percentage South African butterfly taxa (species + additional subspecies) in the butterfly families of the total number of South African butterfly taxa in 1989 and 2009 respectively

Families	Percentage of all butterfly taxa in SA: 1989	Percentage of all butterfly taxa in SA: 2009
Papilionidae	2.7%	2.2%
Pieridae	6.6%	6.1%
Nymphalidae	27.8%	28.7%
Lycaenidae	49.3%	49.6%
Hesperiidae	13.7%	13.4%

\* For this analysis, the category Indeterminate used in 1989 has not been regarded as a threatened category, similar to the exclusion of the categories Near Threatened and Data Deficient in the present IUCN (2001) system that do not constitute threatened categories.

1989 is steeper than it may, at first, appear. A number of these recently described, threatened taxa may be considered to be data deficient. However, ongoing habitat destruction faces recently described butterfly taxa, such as *Aloeides barbarae*, *Aloeides thyra orientis*, *Anthene juanita*, *Dingana fraterna* and *Chrysothis thysbe schloszae*. The imminent threat of habitat modification and destruction for these recently described species suggests that in South Africa we may be approaching a state where taxa might become extinct before they are actually discovered.

Table 5.—Percentage of threatened taxa of the total number of \*threatened South African butterfly taxa (species + additional subspecies) in the butterfly families in 1989 and 2009 respectively

Families	Percentage threatened taxa of total threatened taxa: 1989	Percentage threatened taxa of total threatened taxa: 2009
Papilionidae	0.0%	0.0%
Pieridae	2.0%	0.0%
Nymphalidae	10.8%	12.7%
Lycaenidae	80.4%	81.0%
Hesperiidae	6.9%	6.3%

Table 6.—Percentage \*threatened South African butterfly taxa (species + additional subspecies) of the total number of butterfly taxa in South Africa, among the butterfly families in 1989 and 2009 respectively

Families	Percentage threatened of all SA taxa: 1989	Percentage threatened of all SA taxa: 2009
Papilionidae	0.0%	0.0%
Pieridae	0.3%	0.0%
Nymphalidae	1.5%	1.0%
Lycaenidae	11.4%	6.4%
Hesperiidae	1.0%	0.5%
<b>TOTAL</b>	<b>14.3%</b>	<b>7.9%</b>

Table 7.—Total number of South African butterfly taxa (species + additional subspecies), total number of threatened taxa and total number of uncertain or near threatened taxa in 1989 and 2009 respectively

Families	Number of taxa: 1989	Number of taxa: 2009
South African taxa	716	801
Threatened taxa	102	63
Indeterminate/ Data Deficient/ Near Threatened	41	16

The steep decline in the number of taxa belonging to threatened categories since 1989 may, in reality, be less steep than it first appears. A most disconcerting trend is the apparent increase in the number of species that fall into the most threatened categories, including the Extinct category. For the first time, one butterfly taxon, namely *Lepidochrysops methymna dicksoni*, that has now been added to the Extinct category, has perished owing to confirmed anthropogenic impacts. The increased number of taxa now in the Critically Endangered and Endangered categories is of considerable conservation concern. In this revised Red Data Book, 12 taxa are listed as Critically Endangered and 16 taxa as Endangered. Compare this to the two Endangered and seven Vulnerable taxa listed in 1989. Some of the taxa now listed as Critically Endangered appear to be on the brink of extinction and deserve immediate conservation attention.

The Lycaenidae is not only the family with the largest number of butterfly taxa in South Africa (49.3% of all taxa in 1989 and 49.6% of all taxa in 2009), but unequivocally contains the highest number of threatened species in both the 1989 and 2009 Red Data Books (Figure 2, Figure 3, Tables 2–6). The Lycaenidae have rightfully received proportionately more research effort as well as special conservation attention, for example see S.F. Henning (1983a,b,c; 1984a,b; 1987a,b,c), Cottrell (1984), G.A. Henning (1991, 1997), Samways (1993), Edge (2002), Lu & Samways (2002b) and Terblanche & Van Hamburg (2003, 2004). Most of these threatened lycaenid species are habitat specialists and have complex life histories that often include an obligate association with a specific species of ant during the larval stages. Some lycaenid taxa have been studied in detail and this has led to improved conservation management, for example *Aloeides dentatis dentatis*, *Chrysoritis aureus*, *Orachrysops*

*ariadne* and *O. niobe* (S.F. Henning & G.A. Henning 1989; S.F. Henning, G.A. Henning & Samways 1993a,b,c,d; Deutschländer & Bredenkamp 1999; G.A. Henning & Roos 1999, 2000, 2001; Lu & Samways 2001, 2002a,b; Edge 2002, 2005a; Edge *et al.* 2008a; Terblanche *et al.* 2003; Terblanche & Van Hamburg 2003, 2004). It is to be hoped that this research effort will continue to improve butterfly conservation practice in South Africa and eventually result in lowering the number of threatened taxa. However, the conservation of many of these threatened taxa will probably remain dependent on the implementation of proper habitat management plans.

It is hoped that the present revised Red Data Book, by making use of the more objective IUCN (2001) categories, as well as a stabilised species-level taxonomy, will improve the future discernment of trends in the conservation status of South African butterflies. The first Red Data Book of 1989 brought the conservation of invertebrates in South Africa to centre stage. Attention was drawn to the plight of a number of butterfly species, a few of which then received focused attention. For some, such as the Coega Copper, the Heidelberg Copper (Golden Copper) and Brenton Blue, special reserves have been proclaimed. Under the 2001 IUCN categories the number of threatened species has declined since 1989. Worryingly, however, there are more butterfly taxa today that are either Extinct, Critically Endangered or Endangered. This means that conservation management has to be improved. In 1989 the importance of habitat conservation as the key to butterfly conservation was emphasised. There will only be further progress in stemming the tide of threats to South African butterflies if habitat conservation as a key strategy is incorporated in appropriate legislation, research and conservation management in the future.



# Annotated list of the South African butterfly taxa with Red List assessments

(with brief notes on the butterfly biota of South Africa, Lesotho and Swaziland)

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The total number of taxa assessed for this book is 801: 664 species with 137 additional subspecies. These taxa are classified in five families, 17 subfamilies and 153 genera. The 664 species represent 16.7% of the 3 975 Afrotropical butterfly species. The 801 recorded taxa represent 13.5% of the 5 912 Afrotropical taxa (Williams 2007). The species covered in this study represent 3.3% of the 20 400 Rhopalocera species described globally (Ackery *et al.* 1995; Heppner 2004a,b, as well as references above and sources below).

## Sources used to compile list

Ackery *et al.* (1995); Ball (1994b,c, pers. obs. 1960–2005); Carcasson (1981); Claassens (2000, 2005); Clark & Dickson (1971); D'Abbrera (1980, 1997); Dickson & Kroon (1978); Dobson (2005); Edge (2005a); Germishuys (1982); Heath (1997a; 1997b); Heath *et al.* (2002); Heath & Claassens (2000); Heath & Pringle (2004, 2007); G.A. Henning (1992, 1993a,b); G.A. Henning *et al.* (1997); G.A. Henning & S.F. Henning (1996a,b,c, 1997a,b, 2004); S.F. Henning (1988a, 1994); S.F. Henning & G.A. Henning (1996b,c,d, 1997); Heppner (1991); Joannou *et al.* (1995); Keller Walter *et al.* (1997); Kielland (1990); Kloppers & Van Son (1978); Larsen (1996, 2005); Lawrence (2000); Lawrence *et al.* (1998); Lewis (1973); Libert (1996a,b,c); Lunderstedt (1990); Migdoll (1987); Mucina & Rutherford (2006); Pinhey (1949, 1965); Pringle (1994, 1995, 1998); Pringle *et al.* (1994); Pringle & Kyle (2002); Pringle & Schlosz (1997); Steele (1991); Swanepoel (1953); Terblanche & Henning (1994); Terblanche & Taylor (2000); Tite & Dickson (1968, 1973); Trimen & Bowker (1887–1889); Van Son (1949, 1955, 1963, 1979); Vári *et al.* (2002); Williams (1969); Williams (1993a,b, 1994, 1999, 2007); Woodhall (2005).

## Symbols and abbreviations used

**Occurrence** in Lesotho (L), Swaziland (SW) and the nine South African (SA) provinces:

EC = Eastern Cape; FS = Free State; G = Gauteng; KZN = KwaZulu-Natal; LP = Limpopo (former Northern Province); M = Mpumalanga; NC = Northern Cape; NW = North West; WC = Western Cape.

**Endemicity in a province/country** Province/country abbreviation: in **purple**, e.g. **WC**, or **SA**, means 'exclusive endemicity' (= endemic only to the Western Cape, or South Africa); in **black**, e.g. EC, KZN, means shared endemicity in the Eastern Cape and KwaZulu-Natal.

**Red Data Book 1989** = **RDB 89** (in **blue**). **Updated Red List 1995** = **RL 95** (in **blue**). Conservation status in these publications is abbreviated as follows: **Ex** = Extinct; **E** = Endangered; **V** = Vulnerable; **R** = Rare; **I** = Indeterminate.

**Current Red List 2009** Colours **red**, **orange** and **green** (= colours of traffic lights: conceptualising '**danger/risk**', '**caution**' and '**no present threat**'), with categories according to the status of the IUCN Red List Categories (2001), see Appendix 1: **EX** = Extinct; **CR** = Critically Endangered; **EN** = Endangered; **VU** = Vulnerable; **NT** = Near Threatened; **LC** = Least Concern; **DD** = Data Deficient; **NE** = Not Evaluated. Appendix 2 gives an annotated checklist of previous Red Data Book species (S.F. Henning & G.A. Henning 1989) that are excluded from the present list and Appendix 3 gives the IUCN Red List of 2002 with an indication of retained and excluded taxa.

**Vernacular or common names** This is a continuation of the previous list by Ball (1994b). We believe that it is vital for the layperson, conservators and officials to be able to have a 'user-friendly handle' to apply to any particular taxon. Causes need rallying points and in conservation this usually begins with a name. This will

become increasingly important with further habitat fragmentation and degradation, as well as with global climate change.

**Biome Units (BUs)** These are the nine described biome units of South Africa, Swaziland and Lesotho (Mucina & Rutherford 2006). These authors did not consider the urban and agricultural 'biomes' which may be significant for certain insects. The BUs are abbreviated as follows: Fynbos (FY), Succulent Karoo (SK), Desert (D), Nama-Karoo (NK), Grassland (GR), Savanna (SAV), Albany Thicket (AT), Indian Ocean Coastal Belt (IOCB) and Forest (FO). However, many insects are not bound to one particular BU or distinct vegetation type. They are often found in a number of distinct vegetation types regardless of scale, and butterflies are no exception. Present reliance on host plants to determine the habitat of an insect may be considered pragmatic, but it is not well grounded (Dennis 2003). It is important to realise that the concept of insect 'habitat' is not necessarily a bounded space (Hanski & Gilpin 1997). The use of the term BU is therefore one of convenience (usually applied to the places where adult organisms are found), but with only partial ecological veracity. The eggs, larvae, pupae and adults of many butterflies may be found in different localities in different vegetation or habitat types or biotopes. What is really needed, is a resource-based definition of habitat for the entire suite of metamorphic stages of an organism (Dennis 2003). Many adult butterflies mainly live in the ecotone between BUs and different vegetation types (e.g. forest fringes). As an example, in the southern Cape ESU (George to Witelsbos), females of the Mocker Swallowtail (*Papilio dardanus cenea* Stoll) are seen (mainly in autumn) taking nectar from *Erica speciosa* Andrews, which has long corolla tubes, in fynbos adjacent to the coastal forests between George and Storms River (pers. obs. 1974–2005). One would not, however, primarily consider this swallowtail as a fynbos endemic. It is possible that the *Erica* sp. supplies amino acids that increase the fecundity of the female of this taxon (Jervis & Boggs 2005), when forest nectar sources are diminished. For the first time, BU information is included for all 801 taxa.

**NOTE A** The gender of some taxa varies in the major references mentioned above. The most appropriate usage is included.

**NOTE B** The distributions have been gleaned from many sources, mainly from members of the Lepidopterists' Society of Africa. This is coupled with 48 years of extensive personal observation by the first author in southern Africa. There are probably a number of taxa of which the distributions are wider (or now narrower) than documented. This highlights the importance of a formalised, well co-ordinated, ongoing atlas project. The vital resources and input of the amateur lepidopterist should not be underestimated, but rather appreciated and actively encouraged. The provincial records given do not imply that they are part of the normal home range of a taxon. Some records are those of isolated and rare vagrant taxa.

Dick Southwood said the following in his foreword to the book *Ecology of insects: concepts and applications* (Speight *et al.* 1999): 'Not surprisingly the text emphasizes the truth that it all starts with good observations in the field.' In southern African lepidopterology, these 'good observations' are overwhelmingly those from a dwindling guild of ageing amateurs.

Information is urgently needed to get more accurate, updated and evolving data. This is in the face of accelerated climate change and increasing habitat fragmentation and destruction. Better knowledge and ongoing data collection are needed for effective conservation management, resource expenditure and effort. It is hoped that this issue will be greatly advanced by the proposed Butterfly Atlas project, the major contributors being the following organisations: the Lepidopterists' Society of Africa, SANBI, ADU (University of Cape Town), and some provincial conservation departments and natural history museums. A positive inaugural workshop meeting was held on 8 August 2005 at the SANBI offices in the Pretoria National Botanical Garden.

**NOTE C** For the purposes of this study, the butterflies of only Lesotho, Swaziland and South Africa were considered. This is the same geopolitical region included in a recent comprehensive updated vegetation map of the region (Mucina & Rutherford 2005). No butterfly taxa are known to be restricted to either Lesotho or Swaziland. The satyrine butterfly *Torynesis pringlei* Dickson is known from both Lesotho and Bushman's Nek, in KwaZulu-Natal (one record).

**NOTE D** Regarding numbers of species and subspecies in the study area, the following approach has been used for the purposes of this investigation:

- (a) A single subspecies of a taxon (not nominotypical), where the nominate species is found outside this study area of South Africa, Lesotho and Swaziland, is regarded as a 'species' for tabulation purposes. This subspecies is in effect a representative of a species and is regarded as such for counting/tabulating purposes. As an example, the only representative of *Spialia colotes* in South Africa and Swaziland is the subspecies *transvaaliae*. (Nominate *Spialia colotes colotes* (Druce) is known only from Angola.) In this study and for counting/census purposes/totals, the local subspecies of this skipper is regarded as a 'species'. Conceptually, most South African lepidopterists have no problems in regarding *Danaus chrysippus orientis* as a 'species'.
- (b) If more than one subspecies of a butterfly is found in this study area and the nominate subspecies is not, then one of the subspecies is regarded as a 'species'. As an example, for *Papilio ophidicephalus*, five subspecies (and not the nominate subspecies) are found in some of the warmer forests of South Africa, Lesotho and Swaziland. For tabulation purposes we record this as one 'species' and four subspecies.

# BUTTERFLIES AND SKIPPERS

## PAPILIONOIDEA Latreille, [1802] (True Butterflies)

**PAPILIONIDAE** Latreille, [1802] (Swallowtails and Swordtails). In SA, L and SW: 2 genera with 14 species (2.1% of total species); 4 additional subspecies; all 18 taxa have an RL status of Least Concern. Endemicity: 2 species and 5 subspecies. There are no 'at risk' RL taxa in SA, L and SW.

**PAPILIONINAE** Latreille, [1802]. In SA, L and SW: 2 genera, 14 species and 4 additional subspecies (18 taxa). With 99 Afrotropical species (223 taxa). Note: in the case of *Papilio ophidicephalus*, 5 subspecies occur in SA, but for the purposes of this study, 1 is regarded as a species with 4 additional subspecies. No 'at risk' RL taxa in this subfamily in SA, L and SW.

### PAPILIONINI Latreille, [1802] (Swallowtails)

**Genus *Papilio*** Linnaeus, 1758. This genus occurs worldwide (about 220 species). Only the subgenus *Princeps* is found in the Afrotropical Region (Ackery *et al.* 1995).

**Subgenus *Princeps*** Hübner, 1807. With 57 Afrotropical species (154 taxa).

*P. (P.) constantinus constantinus* Ward, 1871: Constantine's Swallowtail {current RL – LC} [KZN; SW; M; LP; G; NW] [BUs: SAV, FO, IOCB]

*P. (P.) dardanus cenea* Stoll, 1790: Mocker Swallowtail {current RL – LC} [WC; EC; KZN; SW; M; LP] [BU: FO]. It is probable that the population in the southern Cape forests is a separate subspecies/ESU. This most southerly representative of the taxon has a very reduced number of female forms and constant differences on the upper surfaces of the male. Further research is needed.

*P. (P.) demodocus demodocus* Esper, 1798: Citrus Swallowtail {current RL – LC} [all SA provinces; L; SW;] [BUs: all nine]

*P. (P.) echerioides echerioides* Trimen, 1868: White-banded Swallowtail {current RL – LC} [EC; KZN; SW; M; LP (SA; SW)] [BU: FO]

*P. (P.) euphranor* Trimen, 1868: Forest Swallowtail [RDB 89 – I] {current RL – LC} [EC; KZN; M; LP (SA)] [BU: FO]

*P. (P.) nireus lyaeus* Doubleday, 1845: Green-banded Swallowtail {current RL – LC} [L; SW; all SA provinces (but not NC)] [BUs: FO, AT, IOCB, SAV]

*P. (P.) ophidicephalus ayresi* Van Son, 1939: Marieps Emperor Swallowtail {current RL – LC} [M; KZN (SA)] [BU: FO]

*P. (P.) ophidicephalus entabeni* Van Son, 1939: Entabeni Emperor Swallowtail {current RL – LC} [LP (SA)] [BU: FO]

*P. (P.) ophidicephalus phalusco* Suffert, 1904: Southern Emperor Swallowtail {current RL – LC} [EC; KZN (SA)] [BU: FO]

*P. (P.) ophidicephalus transvaalensis* Van Son, 1939: Woodbush Emperor Swallowtail {current RL – LC} [M; LP (SA)] [BU: FO]

*P. (P.) ophidicephalus zuluensis* Van Son, 1939: Eshowe Emperor Swallowtail {current RL – LC} [KZN (SA)] [BU: FO]

### LEPTOCERCINI Kirby, 1896 (Swordtails)

**Genus *Graphium*** Scopoli, 1777. With 39 Afrotropical species (64 taxa).

**Subgenus *Arisbe*** Hübner, 1819.

*G. (A.) angolanus angolanus* (Goeze, 1779): Angola White-lady Swordtail {current RL – LC} [KZN; SW; M; LP; G; NW] [BU: SAV]

*G. (A.) antheus* (Cramer, 1779): Large Striped Swordtail {current RL – LC} [EC; KZN; SW; M; LP; G] [BUs: FO, IOCB]

*G. (A.) colonna* (Ward, 1873): Mamba Swordtail {current RL – LC} [KZN] [BU: IOCB]

*G. (A.) leonidas leonidas* (Fabricius, 1793): Veined Swordtail {current RL – LC} [EC; KZN; SW; M; LP] [BUs: FO, IOCB, SAV]

*G. (A.) morania* (Angas, 1849): Small White-lady Swordtail {current RL – LC} [KZN; SW; M; LP; NW; G] [BUs: SAV, IOCB]

*G. (A.) policenes policenes* (Cramer, 1775): Small Striped Swordtail {current RL – LC} [EC; KZN] [BUs: IOCB, SAV, FO]

*G. (A.) porthaon porthaon* (Hewitson, 1865): Cream Striped Swordtail {current RL – LC} [KZN; M; LP] [BUs: IOCB, FO, SAV]

**PIERIDAE** Swainson, 1820 (Whites, Sulphurs, Orange Tips, Purple Tips, etc.). In SA, L and SW: 14 genera with 46 species (6.9% of total species); 3 additional subspecies (49 taxa). Endemicity: 1 species and 1 subspecies. With 193 Afrotropical species (405 taxa). There are no proposed 'at risk' RL taxa in SA, L and SW.

**COLIADINAE** Swainson, 1821. With 3 genera, 5 species and no additional subspecies. With 15 Afrotropical species (26 taxa). There are no 'at risk' RL taxa in this subfamily in SA, L and SW.

**Genus *Catopsilia*** Hübner, 1819. A widespread Afrotropical (3 species), Oriental and Indo-Australian genus.

*C. florella* (Fabricius, 1775): African Migrant {current RL – LC} [all SA provinces; L; SW] [BUs: all nine]

**Genus *Colias*** Fabricius, 1807. An extensive, predominately northern-hemisphere genus, with 3 Afrotropical species (8 taxa).

*C. electo electo* (Linnaeus, 1763): African Clouded Yellow {current RL – LC} [all SA provinces; L; SW] [BUs: all nine]

**Genus *Eurema*** Hübner, 1819. An extensive, pantropical genus, with 9 species (15 taxa); 2 subgenera in the Afrotropical Region.

**Subgenus *Eurema*** Hübner, 1819. With 4 species in the Afrotropical Region (6 taxa).

*E. (E.) brigitta brigitta* (Stoll, 1780): Broad-bordered Grass Yellow {current RL – LC} [all SA provinces; L; SW] [BUs: FY, SK, NK, AT, SAV, GR, IOCB]

*E. (E.) desjardinsii marshalli* (Butler, 1898): Angled Grass Yellow {current RL – LC} [WC; EC; KZN; SW; M; LP] [BUs: FY, AT, SAV, IOCB, GR]

**Subgenus *Terias*** Swainson, 1821. With 5 Afrotropical species (9 taxa).

*E. (T.) hecabe solifera* (Butler, 1875): Common Grass Yellow {current RL – LC} [EC; KZN; SW; L; M; LP] [BUs: IOCB, SAV, GR]

**PIERINAE** Swainson, 1820. With 11 genera, 41 species and 2 additional subspecies. With 177 Afrotropical species (377 taxa). There are no 'at risk' RL taxa in this subfamily in SA, L and SW.

**TRIBE UNCERTAIN** (Braby *et al.* 2006)

***Colotis* Group** Braby *et al.*, 2006

**Genus *Colotis*** Hübner, 1819. An extensive, subspecies-rich, Afrotropical (44 species; 101 taxa) and Asian genus.

**Subgenus *Colotis*** Hübner, 1819. With 41 species (94 taxa).

*C. (C.) amata calais* (Cramer, 1775): Topaz Tip {current RL – LC} [KZN; M; LP; NW] [BUs: IOCB, SAV]

*C. (C.) antevippe gavis* (Wallengren, 1857): Red Tip {current RL – LC} [WC; EC; KZN; SW; M; G; NW; LP; NC; FS] [BUs: FY, SK, AT, IOCB, SAV, FO]

*C. (C.) auxo* (Lucas, 1852): Sulphur Orange Tip {current RL – LC} [EC; KZN; SW; M; LP; NW; G] [BUs: AT, IOCB, SAV]

*C. (C.) celimene amina* (Hewitson, 1866): Lilac Tip {current RL – LC} [KZN; SW; M; LP] [BU: SAV]

*C. (C.) celimene pholoe* (Wallengren, 1860): Namibian Lilac Tip {current RL – LC} [NC] [BU: SAV]

*C. (C.) danae annae* (Wallengren, 1857): Scarlet Tip {current RL – LC} [EC; KZN; SW; M; FS; LP; G; NW] [BUs: AT, IOCB, SAV]

*C. (C.) doubledayi flavulus* Henning, Henning, Joannou & Woodhall, 1997: Doubleday's Veined Tip [RDB 89 – R] {current RL – LC} [NC] [BUs: SK, D]

*C. (C.) erone* (Angas, 1849): Coast Purple Tip {current RL – LC} [EC; KZN] [BU: IOCB]

*C. (C.) euipe omphale* (Godart, 1819): Smoky Orange Tip {current RL – LC} [all SA provinces; SW] [BUs: all nine]

*C. (C.) evagore antigone* (Boisduval, 1836): Small Orange Tip {current RL – LC} [all SA provinces; SW] [BUs: FY, AT, IOCB, SAV]

*C. (C.) evenina evenina* (Wallengren, 1857): Common Orange Tip {current RL – LC} [all SA provinces; L; SW] [BUs: SK, NK, SAV, GR, IOCB]

*C. (C.) ione* (Godart, 1819): Bushveld Purple Tip {current RL – LC} [EC; KZN; SW; M; LP; G; NW; NC] [BUs: SAV, IOCB]

*C. (C.) lais* (Butler, 1876): Kalahari Orange Tip {current RL – LC} [NC; FS; NW; LP] [BUs: SAV, NK, D]

*C. (C.) pallene* (Hopffer, 1855): Bushveld Orange Tip {current RL – LC} [KZN; SW; M; LP; G; NW] [BUs: SAV, IOCB]

*C. (C.) regina* (Trimen, 1863): Queen Purple Tip {current RL – LC} [KZN; SW; M; LP; G; NW, NC] [BU: SAV]

*C. (C.) vesta argillaceus* (Butler, 1877): Veined Tip {current RL – LC} [KZN; SW; M; LP; G; NW] [BUs: SAV, IOCB]

**Subgenus *Teracolus*** Swainson, 1823. With 2 Afrotropical species (4 taxa).

*C. (T.) eris eris* (Klug, 1829): Banded Gold Tip {current RL – LC} [all SA provinces; SW] [BU: all BUs, with little penetration of FY, GR and FO, but is found in riverine and lowland forest in the warmer parts of SA and SW]

*C. (T.) subfasciatus subfasciatus* (Swainson, 1833): Lemon Tip {current RL – LC} [KZN;

SW; M; G; LP; L; NW; FS; NC] [BUs: SAV, GR (including SAV/GR ecotone), IOCB (rare)]

**Subgenus *Cuneacoltis*** Henning, Henning, Joannou & Woodhall, 1997. With 1 Afrotropical species (3 taxa).

*C. (C.) agoye agoye* (Wallengren, 1857): Speckled Sulphur Tip {current RL – LC} [KZN; SW; M; G; NW; LP] [BUs: SAV, IOCB]

*C. (C.) agoye bowkeri* (Trimen, 1883): Bowker's Speckled Sulphur Tip {current RL – LC} [NC; WC; FS; L; NW; G] [BUs: NK, SAV, D]

**Genus *Pinacopteryx*** Wallengren, 1857. A monobasic, endemic Afrotropical genus with 5 subspecies.

*P. eriphia eriphia* (Godart, 1819): Zebra White {current RL – LC} [all SA provinces; SW] [BUs: AT, IOCB, SAV, GR, NK, SK, FY (Tsitsikamma Mountains and southern Cape, where it is a migrant and not a resident)]

**Genus *Nepheronia*** Butler, 1870. A small, endemic Afrotropical genus with 4 species (12 taxa).

*N. argia varia* (Trimen, 1864): Transkei Large Vagrant {current RL – LC} [EC; KZN (SA)] [BUs: IOCB, FO]

*N. argia variegata* Henning, 1994: Variegated Large Vagrant {current RL – LC} [KZN; SW; M; LP] [BUs: IOCB, SAV, FO]

*N. buquetii buquetii* (Boisduval, 1836): Buquet's Vagrant {current RL – LC} [WC; EC; KZN; SW; M; LP; NW; G] [BUs: FY, AT, IOCB, SAV]

*N. thalassina sinalata* (Suffert, 1904): Cambridge Vagrant {current RL – LC} [KZN; SW; M; LP] [BUs: IOCB, FO, SAV]

**Genus *Eronia*** Hübner, 1823. A small, widespread endemic Afrotropical genus with 2 species (3 taxa).

*E. cleodora cleodora* Hübner, 1823: Vine-leaf Vagrant {current RL – LC} [EC; KZN; SW; M; LP] [BUs: AT, IOCB, SAV, FO]

*E. leda* (Boisduval, 1847): Autumn-leaf Vagrant {current RL – LC} [EC; KZN; SW; M; LP] [BUs: IOCB, SAV]

#### TRIBE UNCERTAIN (Braby *et al.* 2006)

##### *Leptosia* Group Braby *et al.*, 2006

**Genus *Leptosia*** Hübner, 1818. A small Afrotropical (7 species; 14 taxa) and Oriental genus.

*L. alcesta inalcesta* Bernardi, 1959: African Wood White {current RL – LC} [EC; KZN; SW; M; LP] [BUs: IOCB, SAV, FO]

#### PIERINI Swainson, 1820

##### Subtribe *Appiadina* Kusnezov, 1921

**Genus *Appias*** Hübner, 1819. A mainly Oriental and Indo-Australian genus, with 6 Afrotropical species (18 taxa).

##### Subgenus *Glutophrissa* Butler, 1887.

*A. (G.) epaphia contracta* (Butler, 1888): Diverse Rainforest White {current RL – LC} [EC; KZN; SW; M; LP; G; NW] [BUs: IOCB, FO, SAV]

*A. (G.) sabina phoebe* (Butler, 1901): Albatross Rainforest White [RDB 89 – R] {current RL – LC} [EC; KZN; M; LP] [BUs: IOCB, FO/SAV ecotone]

##### Subtribe *Pierina* Swainson, 1820

**Genus *Pieris*** Schrank, 1801. A widespread Palaearctic genus, with 4 Afrotropical species (5 taxa).

*P. brassicae* (Linnaeus, 1758): European Cabbage White {current RL – LC} [WC] [BUs: FY (and 'urban' biome)] Founder population was probably established in 1993 (Geertsema 1996). Now found in the Western Cape from Cape Town eastwards to the George area, and northwards to the Vredendal area. The spread has been aided by the wide availability of cruciferous larval food plants. In Cape Town, Argentine ants (*Iridomyrmex humilis*) have been noted eating first instar European Cabbage White larvae on Brazilian/Peruvian weeds! (Brinkman, pers. comm. 1995). The larval food is mainly nonendemic plants—this all reinforces the cogency of the term 'Homogenocene' (Samways 1999). In the Western Cape, two of the major food plants are the introduced annual cruciferous weeds *Rapistrum rugosum* (L.) All., from the Mediterranean region (Clapham *et al.* 1957), and the nasturtium *Tropaeolum majus* L., from Brazil/Peru (Ball 1994c, Claassens 1995). This is now one of the most common butterflies in urban Cape Town.

**Genus and subgenus *Pontia*** Fabricius, 1807. A mainly Holarctic genus, with 4 Afrotropical species (6 taxa).

*P. (P.) helice helice* (Linnaeus, 1764): Meadow White {current RL – LC} [all SA provinces; L; SW] [BUs: all nine]

##### Subtribe *Aporiina* Chapman, 1895

**Genus *Mylothris*** Hübner, 1819. An extensive, endemic Afrotropical genus with 69 species (117 taxa).

*M. agathina agathina* (Cramer, 1779): Common Dotted Border {current RL – LC} [WC; EC;

KZN; SW; M; FS; LP; G; NW] [BUs: FY, AT, IOCB, SAV, GR, FO edges]

*M. rueppellii haemus* (Trimen, 1879): Twin Dotted Border {current RL – LC} [WC; EC; KZN; SW; M; G; NW; LP] [BUs: FO, AT, IOCB, SAV]

*M. trimenia* (Butler, 1869): Trimen's Dotted Border {current RL – LC} [EC; KZN; SW; M; LP (SA; SW)] [BUs: FO, IOCB]

#### TRIBE UNCERTAIN (Braby *et al.* 2006)

**Genus *Dixeia*** Talbot, 1932. An endemic Afrotropical (10 species; 22 taxa) genus.

*D. charina charina* (Boisduval, 1836): African Small White {current RL – LC} [WC; EC; KZN; SW; M] [BUs: FO, AT, IOCB, SAV]

*D. doxo parva* Talbot, 1943: Black-veined Small White {current RL – LC} [KZN; SW; M; LP] [BU: SAV]

*D. pigea* (Boisduval, 1836): Ant-heap Small White {current RL – LC} [EC; KZN; SW; M; LP] [BUs: IOCB, SAV]

*D. spilleri* (Spiller, 1884): Spiller's Sulphur Yellow {current RL – LC} [KZN; SW; M; LP] [BUs: IOCB, SAV]

**Genus *Belenois*** Hübner, 1819. An extensive, mainly Afrotropical genus (29 species; 66 taxa) with 1 Oriental species.

**Subgenus *Belenois*** Hübner, 1819.

*B. (B.) thysa thysa* (Hopffer, 1855): False Dotted Border {current RL – LC} [EC; KZN] [BUs: IOCB]

*B. (B.) zochalia zochalia* (Boisduval, 1836): Forest White {current RL – LC} [all of SA and SW; but not NC] [BUs: FO, AT, IOCB, SAV]

**Subgenus *Anaphaeis*** Hübner, 1819.

*B. (A.) aurota aurota* (Fabricius, 1793): Brown-veined White {current RL – LC} [all SA provinces; L; SW] [BUs: all nine]

*B. (A.) creona severina* (Stoll, 1781): African Common White {current RL – LC} [WC; EC; KZN; SW; M; LP; G; NW; NC] [BUs: FY, AT, IOCB, SAV, GR]

**Subgenus *Pseudanaphaeis*** Bernardi, 1953.

*B. (P.) gidica abyssinica* (Godart, 1819): African Veined White {current RL – LC} [WC; EC; KZN; SW; M; LP] [BUs: FY, FO, AT, IOCB, SAV]

**NYMPHALIDAE** Swainson, 1827 (Brush-footed Butterflies). In SA, L and SW: 50 genera with 189 species (28.2% of total butterfly species in South

Africa); 41 additional subspecies (230 taxa). With 1 447 Afrotropical species (2 423 taxa). Endemicity: 69 species and 38 subspecies (107 taxa). There are 8 RL taxa (12.7% of RL taxa in South Africa).

**HELICONIINAE** Swainson, 1822 (Vane-Wright 2003; Larsen 2005—Acraeas, Heliconiines and Fritillaries; Silva-Brandão *et al.* 2008). In Africa, previously separated into the Acraeinae and Argynniinae (Ackery *et al.* 1995). However, Heppner (2004b) recognises the categorisation of Acraeinae—in the Nymphaliniina of the Nymphalidae. Here the Acraeini, Argynnini and Vagrantini are listed under the Heliconiinae. In SA, L and SW: 5 genera, 38 species and no additional subspecies. With 246 Afrotropical species (402 taxa) (Williams 2007). See revisions by G.A. Henning (1992; 1993a,b) and G.A. Henning & S.F. Henning (1996b). There is 1 'at risk' RL taxon in this subfamily in SA, L and SW (= 1.6% of current RL butterfly taxa in South Africa).

#### ACRAEINI Boisduval, 1833

**Genus *Acraea*** Fabricius, 1807. This genus is only found in Africa and represents the mainly Passifloraceae-feeding species.

**Subgenus *Acraea*** Fabricius, 1807. With 39 Afrotropical species (53 taxa).

*A. (A.) acara acara* Hewitson, 1865: Acara Acraea {current RL – LC} [EC; KZN; SW; M; LP; NW] [BUs: IOCB, SAV]

*A. (A.) anemosa* Hewitson, 1865: Broad-bordered Acraea {current RL – LC} [EC; KZN; SW; M; LP; G; NW] [BUs: IOCB, SAV]

*A. (A.) barberi* Trimen, 1881: Barber's Acraea {current RL – LC} [G; M; LP; NW (SA)] [BU: SAV]

*A. (A.) boopis boopis* Wichgraf, 1914: Rainforest Acraea {current RL – LC} [EC; KZN; M; LP (SA)] [BU: FO]

*A. (A.) horta* (Linnaeus, 1764): Garden Acraea {current RL – LC} [L; SW; all SA provinces] [BUs: FY, FO, AT, IOCB, SAV, GR]

*A. (A.) machequena* Grose-Smith, 1887: Machequena Acraea [RDB 89 – I] {current RL – LC} [KZN; NW; M; LP] [BUs: SAV, IOCB]

*A. (A.) neobule neobule* Doubleday, 1847: Wandering Donkey Acraea {current RL – LC} [all SA provinces, SW; L] [BUs: SAV, GR, IOCB, NK, SK]

*A. (A.) rabbaiae perlucida* Henning & Henning, 1996: Southern Clear-wing Acraea [RDB 89 – I] {current RL – LC} [KZN; M] [BU: IOCB]

*A. (A.) satis* Ward, 1871: East Coast Acraea [RDB 89 – I] {current RL – LC} [KZN; SW] [BU: IOCB]

*A. (A.) trimeni* Aurivillius, 1899: Trimen's Acraea {current RL – LC} [FS; NC; EC] [BUs: NK, SAV]

**Subgenus *Stephenia*** Henning, 1992. With 25 Afrotropical species (32 taxa).

*A. (S.) aglaonice* Westwood, 1881: Clear-spotted Acraea {current RL – LC} [LP; G; NW; M; SW; KZN] [BUs: SAV, IOCB]

*A. (S.) axina* Westwood, 1881: Little Acraea {current RL – LC} [KZN; SW; M; LP; G; NW] [BUs: SAV, IOCB]

*A. (S.) caldarena caldarena* Hewitson, 1877: Black-tipped Acraea {current RL – LC} [KZN; M; LP; G; NW] [BUs: SAV, IOCB]

*A. (S.) lygus* Druce, 1875: Lygus Acraea {current RL – LC} [NC; FS; LP; G; M] [BU: SAV]

*A. (S.) natalica* Boisduval, 1847: Natal Acraea {current RL – LC} [EC; KZN; SW; M; LP; G; NW] [BUs: IOCB, SAV]

*A. (S.) oncaea* Hopffer, 1855: Window Acraea {current RL – LC} [FS; KZN; SW; M; LP; G; NW] [BUs: IOCB, SAV]

*A. (S.) stenobea* Wallengren, 1860: Suffused Acraea {current RL – LC} [L; FS; NW; G; NC; LP; EC; KZN; M] [BUs: SAV, GR]

**Subgenus *Rubraea*** Henning, 1992. With 37 Afrotropical species (43 taxa).

*A. (R.) acrita acrita* Hewitson, 1865: Fiery Acraea {current RL – LC} [KZN; M; SW; LP] [BUs: IOCB, SAV]

*A. (R.) egina areca* Mabille, 1888: Elegant Acraea {current RL – DD} [LP] [BU: SAV] (very rare vagrant)

*A. (R.) nohara nohara* Boisduval, 1847: Light-red Acraea {current RL – LC} [EC; KZN; SW; M; LP] [BU: GR]

*A. (R.) petraea* Boisduval, 1847: Blood-red Acraea {current RL – LC} [KZN] [BU: IOCB]

*A. (R.) violarum* Boisduval, 1847: Speckled Red Acraea {current RL – LC} [EC; KZN; SW; M; LP; NW] [BUs: SAV, GR]

**Subgenus *Bematistes*** Hemming, 1935. A widespread Afrotropical subgenus with 22 species (64 taxa). (stat.n. G.A. Henning, see G.A. Henning (1992; 1993a,b))

*A.(B.) aganice aganice* Hewitson, 1852: Common Wanderer {current RL – LC} [EC; KZN; SW; M; LP] [BUs: IOCB, SAV, FO]

**Genus *Telchinia*** Hübner, [1819]. A widespread Afrotropical genus with 93 species (163 taxa)

representing the mainly Urticaceae-feeding species. (= *Hyalites* Doubleday, 1848. Silva-Brandão *et al.* 2008.)

**Subgenus *Telchinia*** Hübner, [1819]. 60 Afrotropical species (98 taxa) (*comb. n.*, G.A. Henning)

*T. (T.) cabira* (Hopffer, 1855): Yellow-banded Acraea {current RL – LC} [EC; KZN; SW; M; LP] [BUs: IOCB, SAV, FO] (*comb. n.*, G.A. Henning)

*T. (T.) cerasa cerasa* (Hewitson, 1861): Tree-top Acraea {current RL – LC} [EC; KZN] [BU: IOCB] (*comb. n.*, G.A. Henning)

*T. (T.) encedon encedon* (Linnaeus, 1758): White-barred Acraea {current RL – LC} [SW; all SA provinces except WC and NC] [BUs: IOCB, SAV] (*comb. n.*, G.A. Henning)

*T. (T.) esebria esebria* (Hewitson, 1861): Dusky Acraea {current RL – LC} [EC; KZN; SW; M; LP] [BUs: FO, IOCB] (*comb. n.*, G.A. Henning)

*T. (T.) obeira burni* (Butler, 1896): Pale-yellow Acraea {current RL – LC} [KZN; SW; LP; M; G; NW] [BUs: SAV, IOCB] (*comb. n.*, G.A. Henning)

*T. (T.) serena* (Fabricius, 1775): Dancing Acraea, Small Orange Acraea {current RL – LC} [EC; KZN; FS; SW; M; LP; G; NW] [BUs: IOCB, SAV, FO] (*comb. n.*, G.A. Henning).

Note: this taxon was better known as *Acraea eponina* Cramer, 1780. Pierre & Bernaud (1999) demonstrated that the species name *serena* is the senior synonym.

**Subgenus *Auracraea*** Henning, 1993. With 13 Afrotropical species (18 taxa). (*comb. n.*, G.A. Henning)

*T. (A.) alalonga* Henning & Henning, 1996: Long-winged Orange Acraea {current RL – LC} [KZN; M; LP (SA)] [BU: GR] (*comb. n.*, G.A. Henning)

*T. (A.) anacreon anacreon* (Trimen, 1868): Orange Acraea {current RL – LC} [L; EC; KZN; SW; G; NW; M; FS (SA; SW; L)] [BU: GR] (*comb. n.*, G.A. Henning)

*T. (A.) induna salmontana* Henning & Henning, 1996: Soutpansberg Acraea {current RL – VU B2ab(iii)} [LP (SA)] [BU: GR] (*comb. n.*, G.A. Henning)

*T. (A.) rahira rahira* (Boisduval, 1833): Marsh Acraea {current RL – LC} [SW; all SA provinces except NC] [BUs: FY, GR, SAV, IOCB] (*comb. n.*, G.A. Henning)

**Subgenus *Alacria*** Henning, 1992. With 20 Afrotropical species (38 taxa). (*comb. n.*, G.A. Henning)

*T. (A.) igola* (Trimen, 1889): Dusky-veined Acraea {current RL – LC} [EC; KZN] [BUs: IOCB, FO] (*comb. n.*, G.A. Henning)

#### ARGYNNINI Swainson, 1833

##### Subtribe Argynnina Swainson, 1833

The following genus was previously in the Acraeini, Silva-Brandão *et al.*, 2008.

**Genus *Pardopsis*** Trimen, 1887. A widespread, monobasic, endemic southern and eastern Afrotropical genus.

*P. punctatissima* (Boisduval, 1833): Polka Dot {current RL – LC} [EC; KZN; SW; M; LP] [BUs: FY, GR, IOCB, FO]

#### VAGRANTINI Pinratana & Eliot, 1996

The following two genera were previously in the Argynnini:

**Genus *Lachnoptera*** Doubleday, 1848. An endemic Afrotropical genus with 2 species.

*L. ayresii* Trimen, 1879: Blotched Leopard {current RL – LC} [EC; KZN; SW; M; LP] [BUs: FO, IOCB]

**Genus *Phalanta*** Horsfield, 1829. An Afrotropical (4 species; 6 taxa) and Indo-Australian genus.

*P. eurytis eurytis* (Doubleday, 1847): Forest Leopard {current RL – LC} [KZN; SW; M; LP] [BUs: IOCB, FO]

*P. phalantha aethiopica* (Rothschild & Jordan, 1903): Common Leopard {current RL – LC} [L; SW; all SA provinces except WC] [BUs: AT, IOCB, FO, SAV, GR]

**DANAINAE** Boisduval, 1833 (Monarchs and Milkweeds). In SA, L and SW: 3 genera, 6 species and no additional subspecies. With 24 Afrotropical species (74 taxa). There are no 'at risk' RL taxa in SA, L and SW.

#### DANAINI Boisduval, 1833

**Genus *Danaus*** Kluk, 1780. A large, worldwide genus with only 3 Afrotropical species (4 taxa). *Danaus plexippus* first recorded in Mauritius in 1983 and Réunion in 1985 (Ackery *et al.* 1995). *Danaus dorippus* (Klug, 1845) has been recorded from South Africa but these specimens, as per G.A. Henning, do not represent the species but are forms of *D. chrysippus*, and therefore *D. dorippus* is not listed or assessed.

*D. chrysippus orientis* (Aurivillius, 1909): African Monarch {current RL – LC} [L; SW; all SA provinces] [BUs: all nine]

**Genus *Tirumala*** Moore, 1880. A predominantly Oriental genus, with 2 Afrotropical species (5 taxa).

*T. petiverana* (Doubleday, 1847): Dappled Monarch {current RL – DD} [LP; G] [BUs: SAV, GR] (rare migrant)

**Genus *Amauris*** Hübner, 1816. An endemic Afrotropical genus with 16 species (63 taxa).

**Subgenus *Amauris*** Hübner, 1816. With 2 Afrotropical species (6 taxa).

*A. (A.) niavius dominicanus* Trimen, 1879: Common Friar {current RL – LC} [EC; KZN; SW; M; LP] [BUs: SAV, IOCB]

**Subgenus *Amaura*** Geyer, 1837. With 14 Afrotropical species (57 taxa).

*A. (A.) albimaculata albimaculata* Butler, 1875: Layman Friar {current RL – LC} [EC; KZN; SW; M; LP; G; NW] [BUs: IOCB, SAV]

*A. (A.) echeria echeria* (Stoll, 1790): Chief Friar {current RL – LC} [WC; EC; KZN; SW; M; LP] [BUs: FO, AT, IOCB, SAV]

*A. (A.) ochlea ochlea* (Boisduval, 1847): Novice Friar {current RL – LC} [KZN; SW; M; LP] [BUs: IOCB, SAV, FO]

**SATYRINAE** Boisduval, 1833 (Browns and Ringlets). In SA, L and SW: 21 genera, 76 species and 22 additional subspecies. There are 328 Afrotropical species (423 taxa). This subfamily represents 11.5% of the SA species and 23.2% of the Afrotropical Satyrinae species; 9 genera are endemic. There are 7 at risk RL taxa in this subfamily in SA, L and SW (= 11.1% of current RL butterfly taxa in South Africa).

#### MELANITINI Reuter, 1896

**Genus *Gnophodes*** Westwood, 1851. An endemic Afrotropical genus with 3 species (5 taxa).

*G. betsimensis diversa* (Butler, 1880): Yellow-banded Evening Brown {current RL – LC} [EC; KZN] [BUs: FO, IOCB]

**Genus *Melanitis*** Fabricius, 1807. An Afrotropical (3 species) and Indo-Australian genus.

*M. leda* (Linnaeus, 1758): Common Evening Brown {current RL – LC} [WC; EC; KZN; SW; M; LP; FS; NC; G; NW] [BUs: FO, AT, IOCB, SAV, GR]

**Genus *Aeropetes*** Billberg, 1820. An endemic, monobasic southern African genus (also Zimbabwe).

Probably not more than 2% of South Africa's flora is specially adapted to butterfly pollination. However, this taxon is the sole

known pollinator of about 20 plant species, mainly with large red (or orange) flowers (Johnson 1999).

*A. tulbaghia* (Linnaeus, 1764): Mountain Pride {current RL – LC} [WC; EC; NC; L; KZN; SW; M; LP; FS; NW] [BUs: FY, GR]

**Genus *Paralethe*** Van Son, 1955. An endemic, monobasic genus (4 taxa).

*P. dendrophilus dendrophilus* (Trimen, 1862): Southern Bush Beauty {current RL – LC} [EC (SA)] [BUs: FO, IOCB]

*P. dendrophilus albina* Van Son, 1955: Albina Bush Beauty {current RL – LC} [EC; KZN (SA)] [BUs: FO, IOCB]

*P. dendrophilus indosa* (Trimen, 1879): Indosa Bush Beauty {current RL – LC} [KZN (SA)] [BUs: FO, IOCB]

*P. dendrophilus junodi* (Van Son, 1935): Northern Bush Beauty {current RL – LC} [SW; M; LP (SA; SW)] [BU: FO]

#### SATYRINI Boisduval, 1833

##### Subtribe *Mycalesina* Reuter, 1896

**Genus *Bicyclus*** Kirby, 1871. A speciose Afrotropical genus with 85 species (111 taxa). Closely related to the Oriental genus *Mycalesis*.

*B. anynana anynana* (Butler, 1879): Squinting Bush Brown {current RL – LC} [KZN; SW; M; LP] [BUs: IOCB, SAV, FO]

*B. ena* (Hewitson, 1877): Grizzled Bush Brown {current RL – LC} [KZN; SW; M; LP; G] [BUs: IOCB, SAV]

*B. safitza safitza* (Westwood, 1851): Common Bush Brown {current RL – LC} [WC; EC; KZN; SW; M; LP] [BUs: FO, IOCB, AT, SAV]

**Genus *Heteropsis*** Westwood, [1850]. An endemic Afrotropical genus with 51 species (60 taxa), mainly Madagascar. [*Henotesia* synonymised with *Heteropsis* by Lees & Minet (2003).]

*H. perspicua perspicua* (Trimen, 1873): Eyed Bush Brown {current RL – LC} [KZN; SW; M; LP; G; NW] [BUs: SAV, GR, IOCB]

##### Subtribe *Ypthimina* Reuter, 1896

**Genus *Ypthima*** Hübner, 1818. A widespread Afrotropical (20 species; 27 taxa), Indo-Australian and Oriental genus.

*Y. antennata antennata* Van Son, 1955: Clubbed Ringlet {current RL – LC} [M; LP] [BU: SAV]

*Y. asterope asterope* (Klug, 1832): African Ringlet {current RL – LC} [EC; KZN; SW; M; LP; G] [BUs: AT, IOCB, SAV]

*Y. asterope hereroica* Van Son, 1955: Herero Ringlet {current RL – LC} [WC; NC; EC] [BUs: SAV, SK, NK]

*Y. condamini condamini* Kielland, 1982: Condamin's Ringlet {current RL – DD} [LP] [BU: SAV]. Single specimen from near Letaba, LP. Note: also known from Zimbabwe, Malawi, Zambia, Tanzania, Democratic Republic of the Congo, Kenya, Uganda, Sudan and Ethiopia (Ackery *et al.* 1995).

*Y. granulosa* Butler, 1883: Granular Ringlet {current RL – DD} [KZN; M] [BUs: SAV, IOCB] (rare marginal species)

*Y. impura paupera* Ungemach, 1932: Bushveld Ringlet {current RL – LC} [KZN; SW; M; LP; G; NW] [BUs: SAV, GR]

##### Subtribe uncertain Péna *et al.* (2006)

**Genus *Coenyra*** Hewitson, 1865. An endemic southern African genus with 3 species.

*C. aurantiaca* Riley, 1938: Pondo Shade-fly {current RL – LC} [EC; KZN (SA)] [BUs: AT, IOCB, FO]

*C. hebe* (Trimen, 1862): Zulu Shade-fly {current RL – LC} [KZN; SW; M; LP] (also S Mozambique) [BUs: IOCB, SAV]

*C. rufiplaga* Trimen, 1906: Secucuni Shade-fly {current RL – LC} [M; LP (SA)] [BU: SAV]

**Genus *Physcaneura*** Wallengren, 1857. An endemic Afrotropical genus with 5 species.

*P. panda* (Boisduval, 1847): Dark-webbed Ringlet {current RL – LC} [KZN; SW; M; LP; G; NW] [BU: SAV]

**Genus *Cassionympha*** Van Son, 1955. An endemic South African genus with 3 species.

*C. camdeboo* (Dickson, 1981): Camdeboo Brown [RDB 89 – Rare] {current RL – LC} [EC (SA)] [BU: NK]

*C. detecta* (Trimen, 1914): Cape Brown {current RL – LC} [WC; EC; NC (SA)] [BUs: FY, SK, AT]

*C. cassius* (Godart, 1824): Rainforest Brown {current RL – LC} [WC; EC; KZN; SW; M; LP (SA; SW)] [BUs: FY, FO, AT, IOCB, SAV]

**Genus *Melampus*** Hübner, 1819. An endemic South African genus with 1 species (2 taxa).

*M. huebneri huebneri* Van Son, 1955: Boland Brown {current RL – LC} [WC; NC (SA)] [BUs: FY, SK]

*M. huebneri steniptera* Vári, 1971: Namaqualand Brown {current RL – LC} [WC; NC (SA)] [BU: SK]

**Genus *Neita*** Van Son, 1955. An endemic Afrotropical genus with 6 species (7 taxa).

*N. durbani* (Trimen, 1887): D'Urban's Brown {current RL – LC} [EC (SA)] [BU: GR]

*N. extensa* (Butler, 1898): Savanna Brown {current RL – LC} [M; LP] [BU: SAV]

*N. lotenia* (Van Son, 1949): Loteni Brown {current RL – LC} [KZN; L (SA; L)] [BU: GR]

*N. neita* (Wallengren, 1875): Neita Brown {current RL – LC} [EC; KZN; LP; M; SW; NW (SA; SW)] [BUs: GR, SAV]

**Genus *Coenyropsis*** Van Son, 1958. An endemic Afrotropical genus with 3 species.

*C. natalii natalii* (Boisduval, 1847): Natal Brown {current RL – LC} [NC; NW; G; LP; M] [BU: SAV]

*C. natalii poetulodes* Vári, 1971: Wide-eyed Brown {current RL – LC} [LP (SA)] [BU: SAV]

**Genus *Pseudonympha*** Wallengren, 1857. An endemic southern African genus with 15 species (20 taxa).

*P. gaika* Riley, 1938: Gaika Brown {current RL – LC} [L; KZN; EC (SA)] [BUs: GR, GR/NK ecotone]

*P. hippia* (Cramer, 1779): Burchell's Brown {current RL – LC} [WC; EC (SA)] [BU: FY]

*P. machacha* Riley, 1938: Machacha Brown {current RL – LC} [L; KZN; EC (SA; L)] [BU: GR]

*P. magoides* Van Son, 1955: False Silver-bottom Brown {current RL – LC} [L; EC; KZN; SW; M; LP; WC (SA; L; SW)] [BUs: FY, AT, GR]

*P. magus* (Fabricius, 1793): Silver-bottom Brown {current RL – LC} [WC; EC (SA)] [BUs: FY, AT]

*P. paludis* Riley, 1938: Paludis Brown {current RL – LC} [L; KZN; EC; FS; M (SA; L)] [BU: GR]

*P. paragaika* Vári, 1971: Golden Gate Brown [RDB 89 – R] {current RL – VU D2} [FS: (SA)] [BU: GR]

*P. penningtoni* Riley, 1938: Pennington's Brown {current RL – LC} [KZN; L; EC (SA)] [BU: GR]

*P. poetula* Trimen, 1891: Drakensberg Brown {current RL – LC} [EC; KZN; M; FS; SW; LP (SA; SW)] [BU: GR]

*P. southeyi southeyi* (Pennington, 1953): Southey's Brown {current RL – LC} [EC (SA)] [BU: GR]

*P. southeyi kamiesbergensis* Dickson, 1967: Kamiesberg Brown {current RL – LC} [WC; NC (SA)] [BU: SK]

*P. southeyi wykehami* Dickson, 1967: Wykeham's Brown {current RL – LC} [WC; NC (SA)] [BU: SK]

*P. swanepoeli* Van Son, 1955: Swanepoel's Brown [RDB 89 – R; RL 92 – I] {current RL – CR B2ab(i,ii,iii,iv,v)} [LP (SA)] [BU: GR]

*P. trimenii trimenii* Butler, 1868: Trimen's Brown {current RL – LC} [WC (SA)] [BU: FY]

*P. trimenii namaquana* Van Son, 1966: Trimen's Northern Brown {current RL – LC} [NC (SA)] [BU: SK]

*P. trimenii nieuwveldensis* Dickson, 1966: Nuweveld Brown {current RL – LC} [WC; NC (SA)] [BU: NK]

*P. trimenii ruthae* Dickson, 1966: Ruth's Brown {current RL – LC} [EC (SA)] [BU: GR]

*P. varii* Van Son, 1955: Vári's Brown {current RL – LC} [L; EC; KZN; FS (SA; L)] [BU: GR]

**Genus *Paternympha*** Henning & Henning, 1997. An endemic southern African genus with 2 species.

*P. narycia* (Wallengren, 1857): Small Hillside Brown {current RL – LC} [NC; EC; FS; L; NW; G; LP; M; KZN] [BUs: GR, SAV]

*P. loxophthalma* (Vári, 1971): Hillside Brown {current RL – LC} [LP (SA)] [BUs: GR, SAV]

**Genus *Stygionympha*** Van Son, 1955. An endemic southern African genus with 9 species (13 taxa).

*S. curlei* Henning & Henning, 1996: Curle's Brown {current RL – LC} [KZN; M (SA)] [BU: GR]

*S. dicksoni* (Riley, 1938): Dickson's Brown [RDB 89 – R] {current RL – CR B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)} [WC (SA)] [BU: FY]

*S. geraldii* Pennington, 1970: Gerald's Brown {current RL – LC} [NC (SA)] [BU: SK]

*S. irrorata* (Trimen, 1873): Karoo Brown {current RL – LC} [WC; EC; FS; NC] [BUs: NK, SK]

*S. robertsoni* (Riley, 1932): Robertson's Brown {current RL – LC} [WC; EC; NC; FS] [BU: NK]

*S. scotina scotina* Quickelberge, 1977: Eastern Hillside Brown {current RL – LC} [L; EC; KZN; FS (SA; L)] [BU: GR]

*S. scotina coetzeri* Henning & Henning, 1994: Coetzer's Hillside Brown {current RL – LC} [M; LP (SA)] [BU: GR] (rare, localised populations)

*S. vansoni* (Pennington, 1953): Van Son's Brown {current RL – LC} [NC (SA)] [BU: SK]

*S. vigilans* (Trimen, 1887): Western Hillside Brown {current RL – LC} [WC; EC (SA)] [BUs: FY, SK]

*S. wichgrafi wichgrafi* Van Son, 1955: Wichgraf's Brown {current RL – LC} [FS; M; G; LP; NW (SA)] [BU: GR]

*S. wichgrafi grisea* Henning & Henning, 1996: Wichgraf's Coastal Brown {current RL – LC} [KZN (SA)] [BU: IOCB]

*S. wichgrafi williami* Henning & Henning, 1996: William's Brown {current RL – LC} [KZN; EC; M; FS; L (SA; L)] [BU: GR]

#### Subtribe *Dirina* Verity, 1953 (Widows)

**Genus *Dira*** Hübner, 1819. An endemic South African genus with 4 species (6 taxa).

*D. clytus clytus* (Linnaeus, 1764): Cape Autumn Widow {current RL – LC} [WC; EC (SA)] [BU: FY]

*D. clytus eurina* Quickelberge, 1978: Eastern Cape Autumn Widow {current RL – LC} [EC (SA)] [BUs: AT, IOCB]

*D. jansei* (Swierstra, 1909): Janse's Widow [RDB 89 – I] {current RL – LC} [LP; M (SA)] [BUs: GR/SAV ecotone]

*D. oxylus* (Trimen, 1881): Pondoland Widow {current RL – LC} [EC; KZN (SA)] [BU: GR]

*D. swanepoeli swanepoeli* (Van Son, 1939): Swanepoel's Widow {current RL – LC} [LP (SA)] [BU: GR]

*D. swanepoeli isolata* Van Son, 1955: Blouberg Widow [RDB 89 – R] {current RL – LC} [LP (SA)] [BU: GR]

**Genus *Dingana*** Van Son, 1955. An endemic South African genus with 7 species (7 taxa).

*D. alaedeus* Henning & Henning, 1984: Wakkerstroom Widow [RDB 89 – R] {current RL – LC} [M; KZN (SA)] [BU: GR]

*D. angusta* Henning & Henning, 1996: Long Tom Widow {current RL – LC} [M, SW, LP (SA; SW)] [BU: GR]

*D. alticola* Henning & Henning, 1996: Red-banded Widow {current RL – LC} [M (SA)] [BU: GR]

*D. clara* (Van Son, 1940): Wolkberg Widow {current RL – VU D2} [LP (SA)] [BU: GR] (known from only three localities).

*D. dingana* (Trimen, 1873): Dingaan's Widow {current RL – VU B2ab(iii)} [KZN (SA)] [BU: GR]

*D. fraterna* Henning & Henning, 1996: Stoffberg Widow {current RL – EN B1ac(iv)+2ac(iv); C2a(ii)} [M (SA)] [BU: GR]

*D. jerinae* Henning & Henning, 1996: Jerine's Widow {current RL – VU D2} [LP (SA)] [BU: GR]

**Genus *Serradinga*** Henning & Henning, 1996. An endemic South African genus with 3 species (7 taxa).

*S. bowkeri bowkeri* (Trimen, 1870): Bowker's Widow {current RL – LC} [L; EC (SA; L)] [BUs: GR, NK]

*S. bowkeri bella* (Van Son, 1955): Gorgeous Widow [RDB 89 – I] {current RL – LC} [EC (SA)] [BU: GR]

*S. clarki clarki* (Van Son, 1955): Clark's Widow {current RL – LC} [EC (SA)] [BU: GR]

*S. clarki dracomontana* Henning & Henning, 1996: Drakensberg Widow {current RL – LC} [KZN; EC; M (SA)] [BU: GR]

*S. clarki amissivallis* Henning & Henning, 1996: Lost Widow {current RL – LC} [M (SA)] [BU: GR]

*S. clarki ocrea* Henning & Henning, 1996: Ocrea Widow {current RL – LC} [M (SA)] [BU: GR]

*S. kammanassiensis* Henning & Henning, 1994: Kammanassie Widow {current RL – LC} [WC (SA)] [BU: FY]

**Genus *Torynesis*** Butler, 1898. An endemic South Africa/Lesotho genus with 5 species (6 taxa). Note: there are many undescribed taxa of this widespread and variable genus. Ball has begun a taxonomic revision.

*T. hawequas* Dickson, 1973: Hawequas Widow {current RL – LC} [WC (SA)] [BU: FY]

*T. magna* (Van Son, 1941): Large Widow {current RL – LC} [EC; WC (SA)] [BUs: GR, NK, FY] Note: Edge (2005) mentions an undescribed subspecies of this taxon from the Swartberg and Kammanassie Mountains {current RL – NE}. The entire genus needs review.

*T. mintha mintha* (Geyer, 1837): Mintha Widow {current RL – LC} [WC; NC (SA)] [BU: FY]

*T. mintha piquetbergensis* Dickson, 1967: Piquetberg Widow {current RL – LC} [WC (SA)] [BU: FY]

*T. orangica* Vári, 1971: Golden Gate Widow [RDB 89 – R] {current RL – LC} [FS (SA)] [BU: GR]

*T. pringlei* Dickson, 1979: Pringle's Widow [RDB 89 – R] {current RL – LC} [L; KZN (SA; L)] [BU: GR]

**Genus *Tarsocera*** Butler, 1898. An endemic South African genus with 7 species (8 taxa).

*T. cassina* (Butler, 1868): Sand-dune Widow {current RL – LC} [WC (SA)] [BU: FY]

*T. cassus cassus* (Linnaeus, 1764): Spring Widow {current RL – LC} [NC; WC (SA)] [BUs: FY, SK]

*T. cassus outeniqua* Vári, 1971: Outeniqua Widow {current RL – LC} [WC (SA)] [BUs: FY, SK]

*T. dicksoni* (Van Son, 1962): Dickson's Widow {current RL – LC} [WC; NC (SA)] [BUs: FY, SK, NK]

*T. fulvina* Vári, 1971: Karoo Widow {current RL – LC} [WC; NC; EC; FS (SA)] [BUs: FY, SK, NK]

*T. imitator* Vári, 1971: Deceptive Widow {current RL – LC} [NC; WC (SA)] [BUs: SK, FY]

*T. namaquensis* Vári, 1971: Namaqua Widow {current RL – LC} [WC; NC (SA)] [BU: SK]

*T. southeyae* Dickson, 1969: Southey's Widow {current RL – LC} [EC; NC; WC (SA)] [BUs: SK, NK, AT]

**NYMPHALINAE** Rafinesque, 1815 (Spiny Brush-footed Butterflies). In SA, L and SW: 7 genera, 20 species and no additional subspecies. There are no 'at risk' RL taxa in SA, L and SW.

#### JUNONIINI Reuter, 1896

**Genus *Hypolimnas*** Hübner, 1819. A widespread Afrotropical (15 species) and Indo-Australian genus.

*H. anthedon wahlbergi* (Wallengren, 1857): Variable Diadem {current RL – LC} [L; EC; KZN; SW; M; LP] [BUs: FO, IOCB, SAV]

*H. deceptor deceptor* (Trimen, 1873): Deceptive Diadem {current RL – LC} [EC; KZN; LP] [BU: IOCB]

*H. misippus* (Linnaeus, 1764): Common Diadem {current RL – LC} [L; SW; all SA provinces] [BUs: all biomes except D, scarce in FY, NK and SK]

**Genus *Salamis*** Boisduval, 1833. A widespread Afrotropical genus with 9 species.

*S. anacardii nebulosa* Trimen, 1881: Clouded Mother-of-Pearl {current RL – LC} [EC; KZN; SW; M; LP] [BUs: FO, IOCB, SAV]

*S. parhassus* (Drury, 1782): Common Mother-of-Pearl {current RL – LC} [EC; KZN; SW; M; LP] [BUs: FO, IOCB, SAV]

**Genus *Precis*** Hübner, 1819. A widespread Afrotropical (16 species) and Indo-Australian genus.

*P. antilope* (Feisthamel, 1850): Darker Commodore {current RL – LC} [NW; G; LP; M; SW; KZN] [BUs: SAV, FO]

*P. archesia archesia* (Cramer, 1779): Garden Commodore {current RL – LC} [L; SW; all SA provinces except NC] [BUs: FO, IOCB, GR, SAV]

*P. ceryne ceryne* (Boisduval, 1847): Marsh Commodore {current RL – LC} [EC; KZN; SW; M; G; FS; NW; LP] [BUs: SAV, GR]

*P. octavia sesamus* (Trimen, 1883): Gaudy Commodore {current RL – LC} [L; SW; all SA provinces except WC & NC] [BUs: GR, SAV, FO]

**Genus *Junonia*** Hübner, 1819. A widespread Afrotropical (18 species) and Indo-Australian genus.

*J. hierta cebrene* Trimen, 1870: Yellow Pansy {current RL – LC} [L; SW; all SA provinces] [BUs: all except D]

*J. natalica natalica* (Felder & Felder, 1860): Brown Pansy {current RL – LC} [EC; KZN; SW; M; LP] [BUs: IOCB, FO, SAV]

*J. oenone oenone* (Linnaeus, 1758): Blue Pansy {current RL – LC} [L; SW; all SA provinces except WC] [BUs: AT, IOCB, SAV, GR, NK]

*J. orithya madagascariensis* (Guenée, 1865): Eyed Pansy {current RL – LC} [SW; all SA provinces except WC] [BUs: SAV, GR, IOCB]

*J. terea elgiva* Hewitson, 1864: Soldier Pansy {current RL – LC} [EC; KZN; SW; M; LP] [BUs: IOCB, SAV]

*J. tugela tugela* (Trimen, 1879): Leaf Commodore {current RL – LC} [KZN; SW; M; LP] [BUs: FO, SAV]

#### KALLIMINI Doherty, 1886

**Genus *Catacroptera*** Karsch, 1894. A widespread monobasic Afrotropical genus (2 subspecies).

*C. cloanthe cloanthe* (Stoll, 1781): Pirate {current RL – LC} [L; SW; all SA provinces except NC] [BU: FY (rare in the eastern portion of the WC), GR, SAV, IOCB]

#### NYMPHALINI Rafinesque, 1815

**Genus *Vanessa*** Fabricius, 1807. A worldwide genus, only 2 species found in Africa.

*V. cardui* (Linnaeus, 1758): Painted Lady {current RL – LC} [L; SW; all SA provinces] [BUs: all nine]

**Genus *Antanartia*** Rothschild & Jordan, 1903. A widespread endemic Afrotropical genus with 6 species.

*A. dimorphica dimorphica* Howarth, 1966: Northern Short-tailed Admiral {current RL – LC} [LP; M] [BU: FO]

*A. hippomene hippomene* (Hübner, 1823): Southern Short-tailed Admiral {current RL – LC} [WC; EC; KZN (SA)] [BUs: FO, IOCB]

*A. schaeneia schaeneia* (Trimen, 1879): Long-tailed Admiral {current RL – LC} [EC; KZN; SW; M; LP; G (SA; SW)] [BUs: FO, IOCB]

**BIBLIDINAE** Boisduval, 1833. In SA, L and SW: 3 genera, 8 species. There are no 'at risk' RL taxa in SA, L and SW.

**BIBLIDINI** Boisduval, 1833

**Genus** *Byblia* Hübner, 1819. A widespread Afrotropical (2 species; 5 taxa) and Indo-Australian genus.

*B. anvatarata acheloia* (Wallengren, 1857): Common Joker {current RL – LC} [EC; KZN; SW; M; LP] [BUs: IOCB, SAV, GR]

*B. ilithyia* (Drury, 1773): Spotted Joker {current RL – LC} [EC; KZN; SW; M; LP; G; NW; FS; NC] [BUs: IOCB, SAV, GR]

**Genus** *Eurytela* Boisduval, 1833. A widespread endemic Afrotropical genus with 4 species (10 taxa).

*E. dryope angulata* Aurivillius, 1899: Golden Piper {current RL – LC} [EC; KZN; SW; M; LP] [BUs: IOCB, FO, SAV]

*E. hiarbas angustata* Aurivillius, 1894: Pied Piper {current RL – LC} [WC; EC; KZN; SW; M; LP] [BUs: FO, AT, IOCB, SAV]

**EPICALIINI** Guenée, 1865

**Genus** *Sevenia* Koçak, 1996. A widespread endemic Afrotropical genus with 18 species (26 taxa).

*S. rosa* (Hewitson, 1877): Rosa's Tree Nymph {current RL – LC} [KZN] [BU: IOCB]

*S. boisduvali boisduvali* (Wallengren, 1857): Boisduval's Tree Nymph {current RL – LC} [EC; KZN; SW; M; LP] [BUs: IOCB, FO, SAV]

*S. moranti moranti* (Trimen, 1881): Morant's Tree Nymph {current RL – LC} [EC; KZN; SW; M; LP] [BU: FO, IOCB, SAV]

*S. natalensis* (Boisduval, 1847): Natal Tree Nymph {current RL – LC} [EC; KZN; SW; M; LP] [BU: FO, IOCB, SAV]

**CYRESTINAE** Guenée, 1865. With 1 Afrotropical species (3 taxa). There are no 'at risk' RL taxa in SA, L and SW.

**CYRESTINI** Guenée, 1865

**Genus** *Cyrestis* Boiduval, 1832. An Afrotropical (1 species) and Oriental genus.

**Subgenus** *Azania* Martin, 1903.

*C. (Azania) camillus sublineata* Lathy, 1901: African Map Butterfly [RDB 89 – R] {current RL – LC} [LP] [BU: SAV]

**LIMENITIDINAE** Behr, 1864. In SA, L and SW: 6 genera, 15 species and 5 additional subspecies. There are no 'at risk' RL taxa in South Africa.

**LIMENITIDINI** Behr, 1864. With 201 Afrotropical species (232 taxa).

**Genus** *Neptis* Fabricius, 1807. A widespread, speciose Afrotropical (70 species; 90 taxa), Eurasian and Indo-Australian genus. Common name for *Neptis* = Sailer (Pinhey 1949); Ackery *et al.* (1995) use Sailor.

*N. goochi* Trimen, 1879: Streaked Sailer {current RL – LC} [KZN, SW; M; LP] [BUs: IOCB, SAV, FO]

*N. jordani* Neave, 1910: Jordan's Sailer {current RL – LC} [KZN] [BU: IOCB] (rare, marginal taxon)

*N. kiriakoffi* Overlaet, 1955: Kiriakoff's Sailer {current RL – LC} [KZN] [BU: IOCB] (rare, marginal taxon)

*N. laeta* Overlaet, 1955: Common Sailer {current RL – LC} [EC; KZN; SW; M; LP; NW] [BUs: IOCB, SAV, FO]

*N. penningtoni* Van Son, 1977: Pennington's Sailer {current RL – DD} [LP] [BU: SAV] (rare vagrant)

*N. saclava marpessa* Hopffer, 1855: Spotted Sailer {current RL – LC} [EC; KZN; SW; M; LP; G; NW] [BUs: IOCB, SAV, FO]

*N. trigonophora trigonophora* Butler, 1878: Barred Sailer {current RL – LC} [EC] [BU: FO]

**Genus** *Cymothoe* Hübner, 1819. A widespread and speciose endemic Afrotropical genus with 75 species (142 taxa).

*C. alcimeda alcimeda* (Godart, 1824): Battling Glider {current RL – LC} [WC (SA)] [BU: FO]

*C. alcimeda clarki* Stevenson, 1940: Amatola Glider {current RL – LC} [EC (SA)] [BU: FO]

*C. alcimeda marieps* Rydon, 1994: Marieps Glider {current RL – LC} [M (SA)] [BU: FO]

*C. alcimeda transvaalica* Rydon, 1994: Limpopo Glider {current RL – LC} [LP (SA)] [BU: FO]

*C. alcimeda trimeni* Aurivillius, 1912: Trimen's Glider {current RL – LC} [EC; KZN (SA)] [BU: FO]

*C. coranus coranus* Grose-Smith, 1889: Blonde Glider {**current RL – LC**} [EC; KZN; M; LP] [BUs: FO, IOCB]

**Genus *Pseudacraea*** Westwood, 1850. An endemic Afrotropical genus with 16 species (49 taxa).

*P. boisduvalii trimeni* Butler, 1874: Boisduval's False Acraea {**current RL – LC**} [EC; KZN; SW; M; LP] [BUs: IOCB, FO, SAV]

*P. eurytus imitator* (Trimen, 1873): Wanderer False Acraea {**current RL – LC**} [EC; KZN (SA)] [BUs: IOCB, SAV, FO]

*P. lucretia expansa* (Butler, 1878): Chief False Acraea {**current RL – LC**} [M; LP] [BUs: FO, SAV]

*P. lucretia tarquinia* (Trimen, 1868): Southern False Acraea {**current RL – LC**} [EC; KZN] [BUs: IOCB, FO]

**ADOLIADINI** Doubleday, 1845. With 370 Afrotropical species (556 taxa).

**Genus *Euryphura*** Staudinger, 1891. An endemic Afrotropical genus (mostly in forests) with 10 species (16 taxa).

*E. achlys* (Hopffer, 1855): Mottled-green Nymph [RDB 89 – R] {**current RL – LC**} [KZN] [BUs: IOCB, FO]

**Genus *Euphaedra*** Hübner, 1819. An endemic, speciose Afrotropical genus with 192 species.

**Subgenus *Neophronia*** Hecq, 1985. With 1 Afrotropical species (7 taxa).

*E. (N.) neophron neophron* (Hopffer, 1855): Gold-banded Forester {**current RL – LC**} [KZN] [BU: IOCB]

**Genus *Hamanumida*** Hübner, 1819. A widespread, monobasic Afrotropical genus.

*H. daedalus* (Fabricius, 1775): Guinea-fowl {**current RL – LC**} [KZN; SW; M; LP; G; NW] [BUs: SAV, IOCB]

**CHARAXINAE** Guenée, 1865 (Charaxes, Queens, Emperors and Pallas). With 180 described Afrotropical species (457 taxa). In SA, L and SW: 2 genera, 24 species and 14 additional subspecies (38 taxa). There are no 'at risk' RL taxa in SA, L and SW.

**CHARAXINI** Guenée, 1865. With 170 Afrotropical species (433 taxa).

**Genus *Charaxes*** Ochseneimer, 1816. A widespread and speciose Afrotropical (170 species; 433 taxa), Eurasian and Indo-Australian genus. The common name Charaxes, also used by Larsen (2005), seems preferable to Emperor.

*C. achaemenes achaemenes* Felder & Felder, 1867: Bushveld Charaxes {**current RL – LC**} [LP; G; NW; M; KZN; SW; EC] [BUs: SAV, IOCB]

*C. bohemani* Felder & Felder, 1859: Large Blue Charaxes {**current RL – LC**} [LP; M; SW] [BU: SAV]

*C. brutus natalensis* Staudinger, 1885: White-barred Charaxes {**current RL – LC**} [WC; EC; KZN; SW; M; LP; G; NW] [BUs: FO, AT, IOCB, SAV]

*C. candiope candiope* (Godart, 1824): Green-veined Charaxes {**current RL – LC**} [EC; KZN; SW; M; LP; G; NW] [BUs: FO, IOCB, SAV, GR]

*C. castor flavifasciatus* Butler, 1895: Giant Charaxes {**current RL – LC**} [KZN; SW; M; LP] [BUs: SAV, IOCB]

*C. cithaeron cithaeron* Felder & Felder, 1859: Blue-spotted Charaxes {**current RL – LC**} [EC; KZN; LP] [BUs: FO, IOCB]

*C. druceanus druceanus* Butler, 1869: Southern Silver-barred Charaxes {**current RL – LC**} [KZN (SA)] [BUs: IOCB, FO]

*C. druceanus entabeni* Van Someren, 1963: Entabeni Silver-barred Charaxes {**current RL – LC**} [LP (SA)] [BU: FO]

*C. druceanus moerens* Jordan, 1936: Marieps Silver-barred Charaxes {**current RL – LC**} [M; LP; SW (SA; SW)] [BU: FO]

*C. druceanus solitarius* Henning & Henning, 1992: Blouberg Silver-barred Charaxes {**current RL – LC**} [LP (SA)] [BU: FO]

*C. etesipe tavetensis* Rothschild, 1894: Scarce Forest Charaxes [RDB 89 – I] {**current RL – LC**} [KZN; LP] [BU: IOCB, SAV, FO]

*C. ethalion ethalion* (Boisduval, 1847): Satyr Charaxes {**current RL – LC**} [KZN; SW; M; LP] [BUs: IOCB, FO, SAV]

*C. guderiana guderiana* (Dewitz, 1879): Blue-spangled Charaxes {**current RL – LC**} [LP] [BU: SAV]

*C. jahlusa jahlusa* (Trimen, 1862): Western Pearl-spotted Charaxes {**current RL – LC**} [WC; EC (SA)] [BUs: SK, FY]

*C. jahlusa argynnides* Westwood, 1864: Argynnides Pearl-spotted Charaxes {**current RL – LC**} [KZN] [BUs: IOCB, SAV]

*C. jahlusa rex* Henning, 1978: King Pearl-spotted Charaxes {**current RL – LC**} [NW; G; LP; M; FS] [BU: SAV]

*C. jasius saturnus* Butler, 1866: Foxy Charaxes {current RL – LC} [L; SW; all SA provinces except WC] [BUs: SAV, GR, IOCB]

*C. karkloof karkloof* Van Someren & Jackson, 1957: Eastern Karkloof Charaxes {current RL – LC} [KZN; EC (SA)] [BU: FO]

*C. karkloof capensis* Van Someren, 1966: Eastern Cape Karkloof Charaxes {current RL – LC} [EC (SA)] [BU: FO]

*C. karkloof trimeni* Rydon, 1994: Western Karkloof Charaxes [RL 95 – R] {current RL – LC} [WC (SA)] [BU: FO]

*C. marieps* Van Someren & Jackson, 1957: Marieps Charaxes [RDB 89 – R] {current RL – LC} [M (SA)] [BU: FO]

*C. pelias* (Cramer, 1775): Protea Charaxes {current RL – LC} [WC; EC (SA)] [BUs: FY, SK]

*C. phaeus* Hewitson, 1877: Demon Charaxes {current RL – LC} [NW; G; LP; M; SW; KZN] [BUs: SAV, IOCB]

*C. pondoensis* Van Someren, 1967: Pondo Charaxes [RDB 89 – R] {current RL – LC} [EC (SA)] [BU: IOCB]. Note: this taxon is under no threat at present.

*C. protoclea azota* (Hewitson, 1877): Flame-bordered Charaxes [RDB 89 – I] {current RL – LC} [KZN] [BU: IOCB]

*C. vansoni* Van Someren, 1975: Van Son's Charaxes {current RL – LC} [KZN; SW; M; LP; G; NW] [BU: SAV]

*C. varanes varanes* (Cramer, 1777): Pearl Charaxes {current RL – LC} [WC; EC; KZN; SW; M; LP; NW] [BUs: FO, AT, IOCB, SAV]

*C. violetta violetta* Grose-Smith, 1885: Violet-spotted Charaxes {current RL – DD} [KZN – one vagrant specimen] [BUs: IOCB, SAV]

*C. xiphares xiphares* (Stoll, 1781): Forest-king Charaxes {current RL – LC} [WC; EC (SA)] [BU: FO]

*C. xiphares bavenda* Van Son, 1935: Venda Forest-king Charaxes {current RL – LC} [LP (SA)] [BU: FO]

*C. xiphares draconis* Jordan, 1936: Drakensberg Forest-king Charaxes {current RL – LC} [KZN; SW; M (SA; SW)] [BU: FO]

*C. xiphares kenwayi* Poulton, 1929: Wolkberg Forest-king Charaxes {current RL – LC} [LP (SA)] [BU: FO]

*C. xiphares occidentalis* Pringle, 1995: Langeberg Forest-king Charaxes {current RL – LC} [WC (SA)] [BU: FO]

*C. xiphares penningtoni* Van Son, 1953: Pennington's Forest-king Charaxes {current RL – LC} [KZN (SA)] [BU: FO]

*C. xiphares staudei* Henning & Henning, 1992: Blouberg Forest-king Charaxes {current RL – LC} [LP (SA)] [BU: FO]

*C. xiphares thyestes* (Stoll, 1790): Eastern Cape Forest-king Charaxes {current RL – LC} [EC (SA)] [BU: FO]

*C. zoolina zoolina* (Westwood, 1850): Club-tailed Charaxes {current RL – LC} [EC; KZN; SW; M; LP; G; NW] [BUs: FO, SAV, IOCB]

**EUXANTHINI** Rydon, 1971. With 6 Afrotropical species (15 taxa).

**Genus *Euxanthe*** Hübner, 1819. An endemic Afrotropical genus with 6 species (15 taxa).

**Subgenus *Euxanthe*** Hübner, 1819.

*E. (E.) wakefieldi* (Ward, 1873): Forest Queen {current RL – LC} [KZN; SW; M; LP] [BUs: IOCB, SAV, FO]

**LIBYTHEINAE** Boisduval, 1833 (Snouts). In SA, L and SW: 1 genus, 1 species, no additional subspecies. There are no 'at risk' RL taxa in this subfamily in SA, L and SW.

**Genus *Libythea*** Fabricius, 1807. A widespread, species-poor Afrotropical (3 species; 5 taxa), Oriental and Indo-Australian genus. Two fossilised Libytheinae are known from the late Eocene (Scudder 1889, 1892).

*L. labdaca laius* Trimen, 1879: African Snout {current RL – LC} [EC; KZN; M; LP; SW] [BUs: FO, IOCB, SAV]

**LYCAENIDAE** Leach, 1815 (Blues, Hairstreaks, Coppers). In SA, L and SW: 55 genera with 319 species; 78 additional subspecies (397 taxa); comprise 48.0% of the total species and 49.6% of the total taxa of this Afrotropical subregion. Endemicity in SA, L and SW: 205 species and 62 subspecies. The presence or absence of ant association of larvae is given; this has much relevance in the ecology of these taxa. In this family 51 'at risk' RL taxa in SA, L and SW (= 81% of current RL taxa in SA, L and SW).

There are currently 1 713 described Afrotropical species (2 191 taxa). In the Afrotropical Region, 43% of the 3 975 butterfly species are lycaenids (Ackery *et al.* 1995; plus sources mentioned at the beginning of this list).

The equivalent percentages for other faunal/geographical regions are as follows: West Malaysia 38%

(Fleming 1975; Corbet & Pendlebury 1992); Oriental 36% (Heppner 1991; Parsons 1999); Papua New Guinea 36% (Parsons 1999); Australia 36% (Braby 2000); Europe and Britain 27% (Higgins & Riley 1973; Heppner 1991); Palearctic 20% (Heppner 1991; Parsons 1999); North America 18% (Scott 1997); Neotropical 16% (Heppner 1991; Parsons 1999); Nearctic 16% (Heppner 1991; Parsons 1999).

**PORITINAE** Doherty, 1886. There are 607 described Afrotropical species (781 taxa). In SA, L and SW: 10 genera, 14 species and 11 additional subspecies; 7 species and 9 subspecies are endemic. There are 6 'at risk' RL taxa in this subfamily in SA, L and SW (= 9.5% of current RL taxa in South Africa).

The larvae are endowed with long hairs. They are not overtly ant-associated. The larvae do not have a pair of TOs or a DNO. The larval food is mainly algae or lichen (Bampton 1995). However, some larvae, e.g. those of *Deloneura millari*, were noted taking honeydew from *Sternorrhyncha* (= aphids, scale insects) in the presence of ants (Pringle *et al.* 1994).

**LIPTENINI** Röber, 1892

**Subtribe Pentilina** Aurivillius, 1914. With 142 Afrotropical species (199 taxa).

**Genus *Alaena*** Boisduval, 1847. An endemic Afrotropical genus with 23 species (33 taxa).

*A. amazoula amazoula* (Boisduval, 1847): Southern Yellow Zulu {current RL – LC} [EC; KZN] [BU: IOCB]

*A. amazoula ochroma* Vári, 1976: Northern Yellow Zulu {current RL – LC} [SW; M; LP; NW; G; FS] [BUs: SAV, GR]

*A. margaritacea* Eltringham, 1929: Wolkberg Zulu [RDB 89 – V] {current RL – CR A3ce; B2ab(i,ii,iii,iv,v)} [LP (SA)] [BU: GR]

**Genus *Pentila*** Westwood, 1852. An endemic Afrotropical genus with 39 species (71 taxa).

*P. tropicalis tropicalis* (Boisduval, 1847): Southern Spotted Buff {current RL – LC} [KZN (SA)] [BU: IOCB]

*P. tropicalis fuscipunctata* Henning & Henning, 1994: Northern Spotted Buff {current RL – LC} [LP] [BU: FO]

**Genus *Ornipholidotos*** Bethune-Baker, 1914. An endemic Afrotropical genus with 45 species (48 taxa).

*O. peucetia penningtoni* (Riley, 1944): White Mimic [RDB 89 – R] {current RL – LC} [KZN (SA)] [BU: IOCB]

**Subtribe Durbanina** Clench, 1955. With 4 Afrotropical species (13 taxa).

**Genus *Durbania*** Trimen, 1862. A small endemic South African genus (SA and SW) with 2 species (8 taxa).

*D. amakosa amakosa* Trimen, 1862: Amakosa Rocksitter {current RL – LC} [EC; KZN (SA)] [BU: GR]

*D. amakosa albescens* Quickelberge, 1981: Coastal Rocksitter [RDB 89 – R] {current RL – VU A3c; B2ab(i,ii,iii,iv)} [KZN (SA)] [BU: IOCB (in grassland)]

*D. amakosa ayresi* Van Son, 1941: Northern Rocksitter {current RL – LC} [SW; M (SA; SW)] [BU: GR]

*D. amakosa flavida* Quickelberge, 1981: Shogweni Rocksitter [RDB 89 – I] {current RL – EN A3c; B2ab(i,ii,iii,iv)} [KZN (SA)] [BU: SAV]

*D. amakosa natalensis* Van Son, 1959: Midlands Rocksitter {current RL – LC} [KZN (SA)] [BU: GR]

*D. amakosa penningtoni* Van Son, 1959: Pennington's Rocksitter {current RL – LC} [EC (SA)] [BUs: GR, FY]

*D. amakosa sagittata* Henning & Henning, 1993: Qwa Qwa Rocksitter {current RL – VU B2ab(iii); D2} [FS (SA)] [BU: GR]

*D. limbata* Trimen, 1887: Natal Rocksitter {current RL – LC} [KZN; FS; M (SA)] [BU: GR]

**Genus *Durbaniella*** Van Son, 1959. A small endemic South African genus with 1 species (4 taxa).

*D. clarki clarki* (Van Son, 1941): Clark's Rocksitter {current RL – LC} [WC (SA)] [BUs: FY, SK]

*D. clarki belladonna* Ball, 1994: Ironstone Rocksitter [RL 95 – R] {current RL – VU D2} [EC (SA)] [BUs: NK/AT ecotone]

*D. clarki jenniferae* Ball, 1994: Jennifer's Rocksitter {current RL – LC} [WC; EC (SA)] [BU: FY]

*D. clarki phaea* Ball, 1994: Dark Rocksitter {current RL – LC} [WC (SA)] [BU: FY]

**Genus *Durbaniopsis*** Van Son, 1959. A monobasic endemic South African genus.

*D. saga* (Trimen, 1883): Boland Rocksitter {current RL – LC} [WC; NC (SA)] [BUs: FY, SC]

**Subtribe Liptenina** Röber, 1892. With 461 Afrotropical species (569 taxa).

**Genus *Teriomima*** Kirby, 1887. An endemic Afrotropical genus with 7 species (8 taxa).

*T. zuluana* Van Son, 1949: Zulu Buff {current RL – LC} [KZN (SA)] [BU: IOCB]

**Genus *Baliochila*** Stempffer & Bennett, 1953. An endemic Afrotropical genus with 27 species (28 taxa).

*B. aslanga* (Trimen, 1873): Common Buff {current RL – LC} [KZN; SW; M] [BUs: IOCB, FO]

*B. lipara* Stempffer & Bennett, 1953: Lipara Buff {current RL – LC} [KZN] [BU: IOCB] (a rare marginal species)

**Genus *Cnodontes*** Stempffer & Bennett, 1953. An endemic Afrotropical genus with 4 species (4 taxa).

*C. penningtoni* Bennett, 1954: Pennington's Buff {current RL – LC} [KZN; SW; M; NC; G; NW; LP] [BUs: SAV, IOCB]

*Note.* *C. vansoni* Stempffer & Bennett, 1956: Van Son's Buff [G] [BU: SAV]. Not a valid species (see G.A. Henning & S.F. Henning 2004). Specific rank based upon a single specimen of *C. penningtoni* with the only difference being different genitalia. This is extremely questionable. See, for example, the analysis of the male genitalia of 3 060 dissections of *Pyrgus communis* and *P. albescens* (Hesperidae: Pyrginae) in North America, showing enormous intra- and interspecific variation (Burns 2000).

#### Subtribe *Epitolina* Jackson, 1962

**Genus *Deloneura*** Trimen, 1868. An endemic Afrotropical genus with 7 species (9 taxa).

*D. immaculata* Trimen, 1868: Mbashe River Buff [RDB 89 – E] {current RL – EX} [EC (SA)] [BUs: FO?, SAV/FO ecotone]. Known only from 3 specimens caught in 1863.

*D. millari millari* Trimen, 1906: Millar's Buff {current RL – LC} [KZN; EC] [BU: IOCB]

**MILETINAE** Reuter, 1886. There are 104 Afrotropical species (115 taxa). In SA, L and SW: 3 genera, 32 species and 7 additional subspecies; 27 species and 7 subspecies are endemic. There are 3 'at risk' RL taxa in SA, L and SW (= 4.8% of current RL taxa in South Africa).

**LIPHYRINI** Doherty, 1889. In SA, L and SW: 1 genus, 1 species (which is endemic) and no additional subspecies. There are 31 Afrotropical species (34 taxa). The larvae feed on Coccidae (Sternorrhyncha), the latter being tended by *Crematogaster* ants. Autecological data are poor. Larvae have TOs (diminutive) that do not evert, but no DNO. Larvae probably not ant-associated (Heath & Claassens 2003).

**Genus *Aslauga*** Kirby, 1890. An endemic Afrotropical genus with 28 species (31 taxa).

*A. australis* Cottrell, 1981: Southern Purple [RDB 89 – R] {current RL – DD} [EC; KZN (SA)] [BU: IOCB]. We do not believe that this is an 'at risk' RL taxon at present, but rather DD. Red-Listing this taxon (with a hockey stick-shaped range of about 650 km) now, would be meaningless. The species has apparently not been recorded twice in any recent localities.

**MILETINI** Reuter, 1896. With 65 Afrotropical species (72 taxa). In the genus *Lachnocnema*, the larval food is chiefly Sternorrhyncha (Coccidae) (which themselves are tended by ants) or the secretions of these insects (Heath & Claassens 2003). In the genus *Thestor*, the diet includes ant regurgitations (trophallaxis). All *Thestor* larvae seem to be obligately associated with *Anoplolepis* ants (Formicinae) (Claassens & Dickson 1980; Cottrell 1984; Claassens & Heath 1997; Heath & Claassens 2003).

#### Subtribe *Lachnocnemina* Clench, 1955

**Genus *Lachnocnema*** Trimen, 1887. A widespread Afrotropical genus with 36 species (38 taxa) (many additional species: see revision in Libert 1996a,b,c).

*L. bibulus* (Fabricius, 1793): Common Woolly Legs {current RL – LC} [EC; KZN; SW; M; LP; G; NW] [BUs: AT, IOCB, SAV, often in ecotone with FO]

*L. durbani* Trimen, 1887: D'Urban's Woolly Legs {current RL – LC} [EC; KZN; SW; M; LP; G; NW] [BUs: AT, IOCB, SAV]

*L. laches* (Fabricius, 1793): Southern Pied Woolly Legs {current RL – LC} [EC; KZN; SW; M; LP; G; NW] [BUs: AT, IOCB, SAV, often in ecotone with FO]

*L. regularis regularis* Libert, 1996: Regular Woolly Legs {current RL – DD} [LP] [BU: SAV] (one record only)

**Genus *Thestor*** Hübner, 1819. An endemic southern African genus with 27 species (34 taxa). Only one species (*T. basutus basutus*) is also found outside South Africa (in Botswana and E Zimbabwe). Information taken from Heath & Pringle (2004).

*T. barbatus* Henning & Henning, 1997: Bearded Skolly {current RL – LC} [WC (SA)] [BU: FY]

*T. basutus basutus* (Wallengren, 1857): Basuto Skolly {current RL – LC} [EC; KZN; L; FS; G; M; LP] [BUs: GR, SAV]

*T. basutus capeneri* Dickson, 1972: Northern Skolly {current RL – LC} [NW; G; LP (SA)] [BUs: GR, SAV]

*T. brachycerus brachycerus* (Trimen, 1883): Knysna Skolly [RDB 89 – I; RL 95 – R] {current RL – CR B2ab(i,ii,iii)} [WC (SA)] [BU: FY]

*T. brachycerus dukei* Van Son, 1951: Duke's Skolly {current RL – LC} [WC (SA)] [BU: FY]

*T. braunsi* Van Son, 1941: Brauns' Skolly {current RL – LC} [WC; EC (SA)] [BUs: SK, FY]

*T. calviniae* Riley, 1954: Calvinia Skolly [RDB 89 – R; RL 95 – I] {current RL – LC} [NC (SA)] [BUs: SK, FY]

*T. camdeboo* Dickson & Wykeham, 1994: Camdeboo Skolly [RL 95 – I] {current RL – LC} [EC (SA)] [BU: NK]

*T. claassensi* Heath & Pringle, 2004: Claassens' Skolly {current RL – LC} [WC (SA)] [BU: FY]

*T. compassbergae* Quickelberge & McMaster, 1970: Compassberg Skolly [RDB 89 – I] {current RL – LC} [EC (SA)] [BU: NK]

*T. dicksoni dicksoni* Riley, 1954: Dickson's Skolly [RDB 89 – R] {current RL – LC} [WC (SA)] [BU: FY]

*T. dicksoni malagas* Dickson & Wykeham, 1994: Atlantic Skolly [RL 95 – R] {current RL – VU D2} [WC (SA)] [BU: FY] (in a reserve, more than one colony)

*T. dicksoni warreni* Ball, 1994: Warren's Skolly [RL 95 – I] {current RL – LC} [WC (SA)] [BU: FY]

*T. dryburghi* Van Son, 1966: Dryburgh's Skolly [RDB 89 – I] {current RL – LC} [NC (SA)] [BU: SK]

*T. holmesi* Van Son, 1951: Holmes's Skolly {current RL – LC} [WC (SA)] [BU: FY]

*T. kaplani* Dickson & Stephen, 1971: Kaplan's Skolly [RDB 89 – R; RL 95 – I] {current RL – LC} [WC (SA)] [BU: FY]

*T. montanus* Van Son, 1941: Mountain Skolly {current RL – LC} [WC (SA)] [BU: FY]

*T. murrayi* Swanepoel, 1953: Murray's Skolly {current RL – LC} [WC; EC (SA)] [BU: FY]

*T. overbergensis* Heath & Pringle, 2004: Overberg Skolly {current RL – LC} [WC (SA)] [BU: FY]

*T. penningtoni* Van Son, 1949: Pennington's Skolly {current RL – LC} [WC (SA)] [BU: FY]

*T. petra petra* Pennington, 1962: Rock Skolly {current RL – LC} [WC (SA)] [BU: FY]

*T. petra tempe* Pennington, 1962: Tempe Skolly [RDB 89 – R] {current RL – LC} [WC (SA)] [BUs: FY/NK and FY/SK ecotones]

*T. pictus* Van Son, 1941: Langeberg Skolly [RDB 89 – I] {current RL – LC} [WC (SA)] [BU: FY]

*T. pringlei* Dickson, 1976: Pringle's Skolly [RDB 89 – R; RL 95 – I] {current RL – LC} [NC (SA)] [BU: FY]

*T. protumnus protumnus* (Linnaeus, 1764): Boland Skolly {current RL – LC} [WC; NC (SA)] [BU: FY]

*T. protumnus aridus* Van Son, 1941: Dry Skolly {current RL – LC} [WC; NC; FS (SA)] [BUs: SK, NK]

*T. protumnus terblanchei* Henning & Henning, 1993: Terblanche's Dry Skolly [RL 95 – R] {current RL – VU C2b; D1+2} [FS (SA)] [BU: GR]

*T. rileyi* Pennington, 1956: Riley's Skolly {current RL – LC} [WC (SA)] [BU: FY]

*T. rooibergensis* Heath, 1994: Rooiberg Skolly [RL 95 – I] {current RL – LC} [WC (SA)] [BU: FY]

*T. rossouwi* Dickson, 1971: Rossouw's Skolly [RDB 89 – I] {current RL – LC} [WC (SA)] [BU: FY]

*T. stepheni* Swanepoel, 1968: Stephen's Skolly [RDB 89 – I] {current RL – LC} [WC (SA)] [BU: FY]

*T. strutti* Van Son, 1951: Strutt's Skolly [RDB 89 – R] {current RL – LC} [WC (SA)] [BU: FY]

*T. vansoni* Pennington, 1962: Pennington's Skolly {current RL – LC} [WC (SA)] [BU: FY]

*T. yildizae* Koçak, 1983: Peninsula Skolly [RDB 89 – R] {current RL – LC} [WC (SA)] [BU: FY]

**THECLINAE** Swainson, 1830. There are 286 Afrotropical species (391 taxa). In SA, L and SW: 18 genera, 203 taxa. There are 26 'at risk' RL taxa in SA, L and SW (= 41.3% of current RL taxa in South Africa).

#### APHNAEINI Distant, 1884

**Genus *Chloroselas*** Butler, 1855. An endemic Afrotropical genus with 11 species. Larvae are herbivorous with an obligate ant association. Larvae have (or probably have) TOs and a DNO (Heath & Claassens 2003).

*C.* [= *Desmolycaena* Trimen, 1898; syn. Heath 1997a] *mazoensis* (Trimen, 1898): Purple Gem [KZN; SW; LP; NW; M] [BU: SAV]

*C. pseudozeritis pseudozeritis* (Trimen, 1873): Brilliant Gem {current RL – LC} [EC; KZN; SW; M; LP; G; NW] [BUs: AT, IOCB, SAV]

**Genus *Crudaria*** Wallengren, 1875. An endemic Afrotropical genus with 3 species. Herbivorous larvae have an obligate association with

*Anoplolepis* ants. Larvae have TOs and a DNO (Heath & Claassens 2003).

*C. capensis* Van Son, 1956: Cape Grey {current RL – LC} [WC; EC; NC (SA)] [BUs: SK, NK]

*C. leroma* (Wallengren, 1857): Silver-spotted Grey {current RL – LC} [L; SW; all SA provinces] [BUs: SK, NK, AT, IOCB, SAV, GR, D]

*C. wykehami* Dickson, 1983: Wykeham's Grey {current RL – LC} [EC (SA)] [BU: AT]

**Genus *Chrysoritis*** Butler, 1898. An endemic South African genus with 41 species plus 27 subspecies (68 taxa). A taxonomic paper in which 15 species of *Chrysoritis* were synonymised by Heath (2001) ensued much debate among lepidopterists in South Africa (Heath 2005). Heath (2005) noted that the taxonomy of the genus deserved more illustrative justification. Subsequently Heath & Pringle (2007) produced another review which addressed some shortcomings of the first review of 2001. Further taxonomic study is required about this fascinating but complex group of butterflies. Such taxonomic work could avoid nominal extinctions and could enhance vital and urgent conservation decisions that are based on taxonomic reviews of genera (Terblanche & Van Hamburg 2003). Present distributions in the light of palaeoenvironments (e.g. Deacon & Lancaster 1988) do not appear to have been considered in the recent taxonomic reviews of *Chrysoritis*. The larvae are herbivorous, with an obligate association with mainly *Crematogaster* ants. *Chrysoritis oreas* and *C. pyroeis*, however, are associated with *Myrmecaria nigra* ants (Heath 1997a,c). The larvae have TOs and a DNO (Heath & Claassens 2003).

*C. adonis* (Pennington, 1962): Adonis Opal [RDB 89 – R; RL 95 – I] {current RL – LC} [WC (SA)] [BU: FY]

*C. adonis aridimontis* Heath & Pringle, 2007: Eastern Adonis Opal {current RL – LC} [WC (SA)] [BU: FY]

*C. aethon* (Trimen, 1887): Lydenburg Opal {current RL – LC} [M; KZN; LP (SA)] [BU: GR]

*C. aridus* (Pennington, 1953): Namaqua Opal {current RL – LC} [WC; NC (SA)] [BU: SK]

*C. aureus* (Van Son, 1966): Golden Opal [RDB 89 – R] {current RL – VU B1ab(ii,iv)+2ab(ii,iv); D2} [G; M (SA)] [BU: GR]

*C. azurius* (Swanepoel, 1975): Azure Opal [RDB 89 – R; RL 95 – I] {current RL – LC} [NC (SA)] [BU: FY]

*C. beaufortius beaufortius* (Dickson, 1966): Beaufort Opal {current RL – LC} [NC; WC (SA)] [BUs: FY, SK]

*C. beaufortius charlesi* (Dickson, 1970): Charles' Opal {current RL – LC} [NC (SA)] [BU: FY]

*C. beaufortius stepheni* (Dickson, 1978): Stephen's Opal [RDB 89 – R; RL 95 – I] {current RL – LC} [NC (SA)] [BU: FY]

*C. beaufortius sutherlandensis* Heath & Pringle, 2007: Sutherland Opal {current RL – LC} [NC (SA)] [BU: FY]

*C. beulah* (Quickelberge, 1966): Beulah's Opal {current RL – LC} [EC (SA)] [BUs: AT, SK]

*C. blencathrae* (Heath & Ball, 1992): Waaihoek Opal {current RL – LC} [WC (SA)] [BU: FY]

*C. braueri* (Pennington, 1967): Brauer's Opal {current RL – LC} [EC (SA)] [BUs: GR, SAV]

*C. brooksi brooksi* (Riley, 1938): Brooks' Opal {current RL – LC} [WC (SA)] [BU: FY]

*C. brooksi tearei* (Dickson, 1966): Teare's Opal [RDB 89 – R] {current RL – LC} [WC (SA)] [BU: FY]

*C. chrysantas* (Trimen, 1868): Karoo Daisy Copper {current RL – LC} [WC; NC] [BUs: SK, NK, D]

*C. chrysaor* (Trimen, 1864): Burnished Opal {current RL – LC} [WC; EC; FS; L; M; G (SA)] [BUs: FY, SK, AT, SAV, GR]

*C. daphne* (Dickson, 1975): Daphne's Opal [RDB 89 – R; RL 95 – I] {current RL – LC} [WC (SA)] [BU: FY]

*C. dicksoni* (Gabriel, 1947): Dickson's Strandveld Copper [RDB 89 – V; RL 95 – EN] {current RL – CR A3ce; B2ab(i,ii,iii,iv,vi)} [WC (SA)] [BU: FY]

*C. endymion* (Pennington, 1962): Endymion Opal [RDB 89 – R; RL 95 – I] {current RL – LC} [WC (SA)] [BU: FY]

*C. felthami felthami* (Trimen, 1904): Feltham's Opal {current RL – LC} [WC; NC (SA)] [BUs: FY, SK]

*C. felthami dukei* (Dickson, 1967): Duke's Opal {current RL – LC} [WC; NC (SA)] [BUs: SK, FY]

*C. irene* (Pennington, 1968): Irene's Opal [RDB 89 – R] {current RL – LC} [WC (SA)] [BU: FY]

*C. lycegenes* (Trimen, 1874): Mooi River Opal {current RL – LC} [KZN; M; FS (SA)] [BU: GR]

*C. lyncurium* (Trimen, 1868): Tsomo River Opal [RDB 89 – R] {current RL – VU B2ab(iii,iv); D2} [EC; KZN (SA)] [BU: GR]

*C. midas* (Pennington, 1962): Midas Opal {current RL – LC} [NC; WC (SA)] [BU: FY]

*C. natalensis* (Van Son, 1966): Natal Opal {current RL – LC} [KZN; EC (SA)] [BUs: IOCB, GR]

*C. nigricans nigricans* (Aurivillius, 1923): Dark Opal [RDB 89 – I] {current RL – LC} [WC (SA)] [BU: FY]. This taxon is threatened at Pella (near Atlantis) and is nearly extinct on Table Mountain and the Peninsula. It is, however, fairly common from the coast of the Overberg eastwards.

*C. nigricans zwartbergae* (Dickson, 1982): Swartberg Dark Opal [RDB 89 – I] {current RL – LC} [WC (SA)] [BU: FY]. It is widespread and fairly common on the Great Swartberg.

*C. nigricans rubrescens* Heath & Pringle, 2007: Gamka Dark Opal {current RL – LC} [WC (SA)] [BU: FY].

*C. oreas* (Trimen, 1891): Drakensberg Daisy Copper [RDB 89 – R] {current RL – LC} [KZN (SA)] [BU: GR]

*C. orientalis* (Swanepoel, 1976): Eastern Opal [RDB 89 – I] {current RL – LC} [KZN (SA)] [BU: GR]

*C. palmus palmus* (Stoll, 1781): Western Water Opal {current RL – LC} [WC (SA)] [BU: FY]

*C. palmus margueritae* (Dickson, 1982): Eastern Water Opal {current RL – LC} [WC; EC (SA)] [BU: FY]

*C. pan pan* (Pennington, 1962): Pan Opal [RDB 89 – I] {current RL – LC} [WC (SA)] [BU: FY]

*C. pan henningi* (Bampton, 1981): Henning's Opal [RDB 89 – R; RL 95 – I] {current RL – LC} [WC (SA)] [BU: SK]

*C. pan lysander* (Pennington, 1962): Lysander Opal {current RL – LC} [WC; NC; EC (SA)] [BUs: NK, SK, FY]

*C. pelion* (Pennington, 1953): Machacha Opal {current RL – LC} [EC; L; KZN; FS (SA)] [BU: GR]

*C. penningtoni* (Riley, 1938): Pennington's Opal [RDB 89 – R] {current RL – VU A2c; B2ab(iii); C1} [EC (SA)] [BU: GR]

*C. perseus* (Henning, 1977): Perseus Opal {current RL – LC} [NC (SA)] [BU: SK]

*C. phosphor phosphor* (Trimen, 1864): Southern Scarce Scarlet [RDB 89 – R] {current RL – DD} [EC (SA)] [BU: FO]. Note: the rarity of this high-flying forest taxon is probably more apparent than real. The extent of occurrence of this elusive butterfly is about 35 000 km<sup>2</sup>. The range is patchy in pockets of forest. I find no reasonable rationale to Red-List this essentially DD taxon at present.

*C. phosphor borealis* (Quickelberge, 1972): Northern Scarce Scarlet [RDB 89 – R] [current RL – DD] [M; KZN (SA)] [BU: FO]. The extent of the patchy occurrence of this forest-dwelling taxon is about 145 000 km<sup>2</sup>. At present, I find no compelling rationale to Red-List this insect, which has a rather disjunctive, bipartite distribution.

*C. plutus* (Pennington, 1967): Plutus Opal {current RL – LC} [WC; EC (SA)] [BU: FY]

*C. pyramus pyramus* (Pennington, 1953): Pyramus Opal [RDB 89 – R; RL 95 – I] {current RL – LC} [WC (SA)] [BU: FY]

*C. pyramus balli* (Dickson & Henning, 1981): Ball's Opal [RDB 89 – R; RL 95 – I] {current RL – LC} [WC (SA)] [BU: FY]

*C. pyroeis pyroeis* (Trimen, 1864): Sand-dune Opal {current RL – LC} [WC; NC (SA)] [BUs: FY, SK]

*C. pyroeis hersaleki* (Dickson, 1970): Hersalek's Opal [RDB 89 – R] {current RL – LC} [EC (SA)] [BU: FY]

*C. rileyi* (Dickson, 1966): Riley's Opal [RDB 89 – R] {current RL – EN B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)} [WC (SA)] [BU: FY]

*C. swanepoeli swanepoeli* (Dickson, 1965): Swanepoel's Opal [RDB 89 – R; RL 95 – I] {current RL – LC} [WC (SA)] [BU: SK]

*C. swanepoeli hyperion* (Dickson, 1975): Hyperion Opal [RDB 89 – R; RL 95 – I] {current RL – LC} [WC (SA)] [BU: FY]

*C. thysbe thysbe* (Linnaeus, 1764): Common Opal {current RL – LC} [WC (SA)] [BUs: FY, SK]

*C. thysbe osbecki* (Aurivillius, 1882): Common Opal {current RL – LC} [NC; WC (SA)] [BUs: FY, SK]

*C. thysbe bamptoni* (Dickson, 1976): Bampton's Opal {current RL – LC} [NC (SA)] [BU: SK]

*C. thysbe mithras* Pringle, 1994: Brenton Opal [RL 95 – R] {current RL – EN B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)} [WC (SA)] [BU: FY]

*C. thysbe psyche* (Pennington, 1967): Psyche Opal {current RL – LC} [NC; WC (SA)] [BUs: SK, FY]

*C. thysbe schloszae* (Dickson, 1994): Schlosz's Opal {current RL – CR C2a(i)} [WC (SA)] [BU: FY]

*C. thysbe whitei* (Dickson, 1994): Algoa Opal {current RL – EN A3ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)} [EC (SA)] [BU: Azonal Vegetation Type]

*C. trimeni* (Riley, 1938): Trimen's Opal [RDB 89 – I] {current RL – VU A3c; D2} [NC (SA)] [BU: SK]

*C. turneri turneri* (Riley, 1938): Turner's Opal {current RL – LC} [WC; EC; NC (SA)] [BUs: FY, SK, NK]. Note: Edge (2005) mentions an undescribed subspecies of this taxon from the Huis River Pass [WC] [BU: SK]. There are a number of other geographic varieties of this species that need thorough taxonomic investigation.

*C. turneri amatola* (Dickson & McMaster, 1967): Amatola Opal {current RL – LC} [EC; L (SA; L)] [BU: GR]

*C. turneri wykehami* (Dickson, 1980): Wykeham's Opal [RDB 89 – R; RL 95 – I] {current RL – LC} [NC (SA)] [BU: FY]

*C. uranus uranus* (Pennington, 1962): Uranus Opal {current RL – LC} [WC (SA)] [BU: FY]

*C. uranus schoemani* (Heath, 1994): Schoeman's Opal {current RL – LC} [WC; NC (SA)] [BU: FY]

*C. violescens* (Dickson, 1971): Violescent Opal {current RL – LC} [NC (SA)] [BU: FY]

*C. zeuxo zeuxo* (Linnaeus, 1764): Jitterbug Daisy Copper {current RL – LC} [WC; EC (SA)] [BUs: FY, SK]

*C. zeuxo cottrelli* (Dickson, 1975): Cottrell's Daisy Copper [RDB 89 – E] {current RL – LC} [WC (SA)] [BU: FY]

*C. zonarius zonarius* (Riley, 1938): Donkey Daisy Copper {current RL – LC} [WC (SA)] [BU: FY]

*C. zonarius coetzeri* Dickson & Wykeham, 1994: Coetzer's Donkey Daisy Copper {current RL – LC} [NC (SA)] [BUs: FY, SK]

**Genus *Trimenia*** Tite & Dickson, 1973. An endemic South African genus with 5 species. The larvae are probably all herbivorous, with an obligate *Anoplolepis* ant association. Larvae have TOs. It is not known whether the larvae have a DNO (Heath & Claassens 2003).

*T. argyrolaga argyrolaga* (Dickson, 1967): Large Silver-spotted Copper {current RL – LC} [WC; EC; NC (SA)] [BUs: SK, NK, FY, AT]

*T. argyrolaga cardouwae* Dickson & Wykeham, 1994: Dasklip Silver-spotted Copper {current RL – LC} [WC (SA)] [BU: FY]

*T. macmasteri macmasteri* (Dickson, 1968): McMaster's Silver-spotted Copper {current RL – LC} [WC; NC; EC (SA)] [BUs: FY, SK, NK, AT, SAV]

*T. macmasteri mijburghi* Dickson, 1980: Mijburgh's Silver-spotted Copper {current RL – LC} [NC] [BUs: SK, D, NK]

*T. malagrida malagrida* (Wallengren, 1857): Scarce Mountain Copper [RDB 89 – V; RL 95 – EN] {current RL – CR A4ce; 2ab(i,ii,iii,iv,v); D} [WC (SA)] [BU: FY]

*T. malagrida cedrusmontana* (Dickson & Stephen, 1975): Cedarberg Scarce Mountain Copper [RDB 89 – R; RL 95 – I] {current RL – LC} [WC (SA)] [BU: FY]. Note: this taxon is not threatened in any way at present. It has a wide Cederberg distribution and can be found in huge colonies.

*T. malagrida maryae* (Dickson & Henning, 1981): Overberg Scarce Mountain Copper [RDB 89 – V; RL 95 – R] {current RL – LC} [WC (SA)] [BU: FY]. Note: Edge (2005) has proposed that this taxon be given Vulnerable status, but this is not valid as there are many other large colonies between De Hoop Nature Reserve and Vermaaklikheid (and beyond) in the Western Cape.

*T. malagrida paarlensis* (Dickson, 1967): Paarl Scarce Mountain Copper [RDB 89 – R] {current RL – EN B2ab(i,ii,iii,iv,v)} [WC (SA)] [BU: FY]

*T. wallengrenii wallengrenii* (Trimen, 1887): Wallengren's Silver-spotted Copper [RDB 89 – R] {current RL – CR A3ce; B1ab(i,ii,iii,iv,v)+2 ab(i,ii,iii,iv,v)} [WC (SA)] [BU: FY]

*T. wallengrenii gonnemoui* Ball, 1994: Piquetberg Silver-spotted Copper {current RL – VU B2ab(iii); D2} [WC (SA)] [BU: FY]

*T. wykehami* (Dickson, 1969): Wykeham's Silver-spotted Copper {current RL – LC} [WC; NC (SA)] [BUs: FY, NK]

**Genus *Argyraspodes*** Tite & Dickson, 1973. An endemic southern African genus with 1 species. Also found in Namibia and Botswana, but regarded as a South African endemic. The larvae are herbivorous. It is not known whether they have TOs or a DNO, or whether there is an ant association (Heath 1997a,c).

*A. argyraspis* (Trimen, 1873): Warrior Silver-spotted Copper {current RL – LC} [WC; NC; EC; FS] [BUs: FY, SK, NK, D]

**Genus *Cigaritis*** Donzel, 1847. A widespread Afrotropical (35 species), Oriental and Indo-Australian genus. The larvae are herbivorous and possess TOs as well as a DNO. The larvae of all the South African species appear to have an obligate association with *Crematogaster* ants (Heath & Claassens 2003).

*C. apelles* (Oberthür, 1878): Rusty Bar {current RL – DD} [KZN] (only one specimen known, ?vagrant) [BU: IOCB]

*C. ella* (Hewitson, 1865): Ella's Bar {current RL – LC} [NC; NW; FS; G; LP; M; KZN; SW] [BUs: AT, IOCB, SAV, GR]

*C. mozambica* (Bertolini, 1850): Mozambique Bar {current RL – LC} [L; SW; all SA provinces except NC, WC and EC] [BUs: IOCB, SAV, GR]

*C. namaquus* (Trimen, 1874): Namaqua Bar {current RL – LC} [WC; NC] [BU: SK]

*C. natalensis* (Westwood, 1852): Natal Bar {current RL – LC} [L; SW; all SA provinces except WC] [BUs: AT, IOCB, SAV, GR]

*C. phanes* (Trimen, 1873): Silver Bar {current RL – LC} [KZN; SW; M; LP; G; NC; NW; FS] [BUs: SAV, GR, NK]

**Genus *Axiocerses*** Hübner, 1819. A widespread, endemic Afrotropical genus with 23 species. See revision by S.F. Henning & G.A. Henning (1996b). The studied larvae are herbivorous and possess TOs as well as a DNO. There appears to be a facultative larval ant association (Heath & Claassens 2003).

*A. amanga amanga* (Westwood, 1881): Bush Scarlet {current RL – LC} [KZN; SW; M; LP; G; NW] [BUs: SAV, GR]

*A. coalescens* Henning & Henning, 1996: Black-tipped Scarlet {current RL – LC} [G; M; LP; NW] [BU: SAV]

*A. croesus* (Trimen, 1862): Dark-banded Scarlet {current RL – LC} [EC; KZN (SA)] [BUs: AT, IOCB]

*A. tjoane tjoane* (Wallengren, 1857): Common Scarlet {current RL – LC} [EC; KZN; SW; M; LP; G; NW] [BUs: AT, IOCB, SAV, GR]

**Genus *Aloeides*** Hübner, 1819. An endemic Afrotropical genus with 56 species. Mainly, but not exclusively South African. Most of the studied larvae are herbivorous and have TOs as well as a DNO. There is an obligate larval ant association with various ant species in different genera—*Monomorium*, *Pheidole* and *Lepisiota* (Heath & Claassens 2003).

*A. almeida* (Felder, 1862): Almeida Copper {current RL – LC} [WC; EC (SA)] [BUs: FY, SK]

*A. apicalis* Tite & Dickson, 1968: Pointed Copper {current RL – LC} [WC; NC (SA)] [BUs: FY, SK, NK]

*A. aranda* (Wallengren, 1857): Aranda Copper {current RL – LC} [L; SW; all SA provinces] [BUs: all except D and FO]

*A. arida* Tite & Dickson, 1968: Arid Copper {current RL – LC} [WC; NC (SA)] [BUs: SK, FY]

*A. bamptoni* Tite & Dickson, 1977: Bampton's Copper {current RL – LC} [NC (SA)] [BU: SK]

*A. barbarae* Henning & Henning, 1994: Barbara's Copper [RL 95 – R] {current RL – EN A3ce; B1ab(ii,iii)+2ab(ii,iii)} [M (SA)] [BU: GR]

*A. barklyi* (Trimen, 1874): Barkly's Copper {current RL – LC} [WC; NC (SA)] [BUs: SK, FY]

*A. braueri* Tite & Dickson, 1968: Brauer's Copper {current RL – LC} [EC; L (SA; L)] [BU: GR]

*A. caffrariae* Henning, 1987: Border Copper {current RL – LC} [EC (SA)] [BU: AT]

*A. caledoni* Tite & Dickson, 1973: Caledon Copper [RDB 89 – R; RL 95 – I] {current RL – LC} [WC; EC (SA)] [BUs: FY, SK, GR]. Occurs in a few localised but widespread, sparse colonies.

*A. carolynnae carolynnae* Dickson, 1983: Carolynn's Copper [RDB 89 – R] {current RL – EN A3ce; B2ab(i,ii,iii,iv,v)} [WC (SA)] [BU: FY]

*A. carolynnae aurata* Pringle, 1994: De Hoop Copper {current RL – VU D2} [WC (SA)] [BU: FY]

*A. clarki* Tite & Dickson, 1968: Coega Copper [RDB 89 – R] {current RL – EN A3ce; B2ab(i,ii,iii,iv,v)} [EC (SA)] [BU: AT]

*A. damarensis damarensis* (Trimen, 1891): Damara Copper {current RL – LC} [WC; NC; EC; FS] [BUs: FY, SK, NK, D, SAV, GR]

*A. damarensis mashona* Tite & Dickson, 1973: Mashona Copper {current RL – LC} [KZN; SW; M; G; LP; NW] [BU: SAV]

*A. dentatis dentatis* (Swierstra, 1909): Roodepoort Copper [RDB 89 – R] {current RL – VU B2ab(ii,iii); D2} [G (SA)] [BU: GR].

*A. dentatis maseruna* (Riley, 1938): Maseru Copper [RDB 89 – I] {current RL – LC} [L; FS; NW (SA; L)] [BU: GR]. Note: the extent of occurrence is considerably larger than the area of occupancy. The *A. dentatis* complex needs significant atlasing, monitoring and taxonomic revision.

*A. depicta* Tite & Dickson, 1968: Depicta Copper {current RL – LC} [EC; WC (SA)] [BUs: FY, AT, SK]

*A. dicksoni* Henning, 1987: Dickson's Copper {current RL – LC} [EC (SA)] [BUs: GR, NK]

*A. dryas* Tite & Dickson, 1968: Dryas Copper {current RL – LC} [LP; M; KZN; SW (SA; SW)] [BUs: GR and ecotone with FO]

*A. egerides* Tite & Dickson, 1968: Red Hill Copper [RDB 89 – R] {current RL – NT} [WC (SA)] [BU: FY]

*A. gowani* Tite & Dickson, 1968: Gowan's Copper {current RL – LC} [WC; EC; NC; FS (SA)] [BUs: NK, SAV]

*A. henningi* Tite & Dickson, 1973: Henning's Copper {current RL – LC} [L; G; LP; M; KZN; EC; FS (SA; L)] [BUs: GR, SAV]

- A. juana* Tite & Dickson, 1968: Juana Copper {current RL – LC} [WC; EC; NC (SA)] [BUs: FY, SK]
- A. kaplani* Tite & Dickson, 1977: Kaplan's Copper [RDB 89 – I] {current RL – LC} [WC; NC (SA)] [BUs: FY, NK]
- A. lutescens* Tite & Dickson, 1968: Worcester Copper [RDB 89 – R] {current RL – VU B1ab(ii)+2ab(ii)} [WC (SA)] [BU: FY]
- A. macmasteri* Tite & Dickson, 1973: McMaster's Copper {current RL – LC} [EC; WC; NC (SA)] [BUs: NK, AT, SK, FY]
- A. maluti* Pringle, 1983: Maluti Copper {current RL – LC} [L; FS; EC (SA)] [BU: GR]
- A. margaretae* Tite & Dickson, 1968: Marguerite's Copper {current RL – LC} [WC (SA)] [BUs: FY, SK]
- A. mbuluensis* Pringle, 1994: Mbulu Copper {current RL – LC} [EC; KZN (SA)] [BU: GR]
- A. merces* Henning & Henning, 1986: Wakkerstroom Copper [RDB 89 – R] {current RL – LC} [KZN; M (SA)] [BU: GR]
- A. molomo molomo* (Trimen, 1870): Molomo Copper {current RL – LC} [L; EC; KZN; SW; M; NC; FS; G; NW; LP] [BUs: SAV, GR, NK]
- A. molomo krooni* Tite & Dickson, 1973: Kroon's Copper {current RL – LC} [NC] [BU: SAV]
- A. monticola* Pringle, 1994: Cedarberg Copper {current RL – LC} [WC (SA)] [BU: FY]
- A. nollothi* Tite & Dickson, 1977: Nolloth's Copper [RDB 89 – I] {RL 05 – LC} [NC (SA)] [BU: SK]
- A. nubilus* Henning & Henning, 1982: Cloud Copper [RDB 89 – R] {current RL – EN A3ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)} [M (SA)] [BU: GR]
- A. oreas* Tite & Dickson, 1968: Oreas Copper {current RL – LC} [KZN; FS; EC; L; M (SA; L)] [BU: GR]
- A. pallida pallida* Tite & Dickson, 1968: Giant Copper {current RL – LC} [WC; EC; NC; FS (SA)] [BUs: AT, NK, SK, GR]
- A. pallida grandis* Tite & Dickson, 1968: Splendid Giant Copper {current RL – LC} [WC (SA)] [BU: FY]
- A. pallida jonathani* Pringle, 1987: Kammanassie Giant Copper {current RL – LC} [WC (SA)] [BU: FY]
- A. pallida juno* Pringle, 1994: Tsitsikamma Giant Copper {current RL – LC} [WC (SA)] [BU: FY]
- A. pallida littoralis* Tite & Dickson, 1968: Knysna Giant Copper {current RL – NT} [WC (SA)] [BU: FY].
- Note: Edge (2005b) mentions an undescribed and Vulnerable subspecies of *Aloeides pallida* from The Lakes, Sedgfield {current RL – NT} [WC] [BU: FY]. There are a number of other undescribed subspecies in the Western Cape. These subspecies have not been included in the present list, but deserve research in the near future.
- A. pallida liversidgei* Pringle, 1994: Baviaanskloof Giant Copper {current RL – LC} [EC (SA)] [BU: FY]
- A. penningtoni* Tite & Dickson, 1968: Pennington's Copper {current RL – LC} [KZN; EC (SA)] [BU: GR]
- A. pierus* (Cramer, 1779): Dull Copper {current RL – LC} [WC; EC; FS; NC; L (SA; L)] [BUs: FY, SK, NK, AT, GR]
- A. pringlei* Tite & Dickson, 1976: Pringle's Copper [RDB 89 – I] {current RL – LC} [EC (SA)] [BU: GR]
- A. quickelbergei* Tite & Dickson, 1968: Quickelberge's Copper {current RL – LC} [WC (SA)] [BU: FY]
- A. rileyi* Tite & Dickson, 1976: Riley's Copper {current RL – LC} [FS; L (SA; L)] [BU: GR]
- A. rossouwi* Henning & Henning, 1982: Rossouw's Copper [RDB 89 – R] {current RL – EN A3ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)} [M (SA)] [BU: GR]
- A. simplex* (Trimen, 1893): Dune Copper {current RL – LC} [NC] [BUs: SAV, NK]
- A. stvensoni* Tite & Dickson, 1973: Stevenson's Copper {current RL – VU D2} [LP (SA)] [BU: GR]
- A. susanae* Tite & Dickson, 1973: Susan's Copper {current RL – LC} [KZN; EC; FS (SA)] [BU: GR]
- A. swanepoeli* Tite & Dickson, 1973: Swanepoel's Copper {current RL – LC} [SW; KZN; M; LP (SA; SW)] [BUs: SAV, GR, IOCB]
- A. taikosama* (Wallengren, 1857): Dusky Copper {current RL – LC} [L; SW; all SA provinces] [BUs: SAV, GR, IOCB, AT, FY]
- A. thyra thyra* (Linnaeus, 1764): Red Copper {current RL – LC} [WC (SA)] [BUs: FY, SK]
- A. thyra orientis* Pringle, 1994: Brenton Copper {current RL – EN B2ab(i,ii,iii,iv,v); C2a(i)} [WC (SA)] [BU: FY]
- A. titei* Henning, 1987: Tite's Copper {current RL – LC} [M; KZN (SA)] [BU: GR]

*A. trimeni trimeni* Tite & Dickson, 1973: Trimen's Copper {current RL – LC} [L; all SA provinces] [BUs: AT, GR, NK]

*A. trimeni southeyae* Tite & Dickson, 1973: Southey's Copper [RDB 89 – R] {current RL – VU A3ce; B1ab(iii)+2ab(iii)} [WC (SA)] [BU: FY]

*A. vansoni* Tite & Dickson, 1968: Van Son's Copper {current RL – LC} [NC; WC; EC (SA)] [BUs: SK, NK, FY]

**Genus *Erikssonia*** Trimen, 1891. A small, Data Deficient, endemic Afrotropical genus with 3 species. Taxonomic status of the South African taxon not finally assessed (G. Henning, pers. comm. 2004). The larvae of this taxon are herbivorous (*Gnidia kraussiana* Meisn., Thymelaeaceae) and possess TOs as well as a DNO. There is an obligate association with an ant species of the genus *Lepisiota* (S.F. Henning 1984c).

*E. acraeina* Trimen, 1891: Eriksson's Copper [RDB 89 – V] {current RL – CR A1ac+2a; B1a b(iii,v)c(iv)+2ab(iii,v)c(iv)} [LP] [BU: SAV]. This taxon is most likely an undescribed species distinct from topotypical *E. acraeina*.

**Genus *Aphnaeus*** Hübner, 1819. A spectacular, endemic Afrotropical genus with 21 species.

**Subgenus *Paraphnaeus*** Thierry-Mieg, 1904.

*A. (P.) hutchinsonii* Trimen, 1887: Hutchinson's Highflier {current RL – LC} [KZN; LP; G; M; SW] [BU: SAV] The larvae of this taxon are herbivorous and possess TOs and a DNO. There is an obligate ant association with a *Crematogaster* species (Edge 1990).

**Genus *Tylopaedia*** Tite & Dickson, 1973. A monobasic southern African genus, also found in Namibia and Botswana. The larvae of this taxon are herbivorous (for subsp. *peringueyi*: *Aspalathus*, Fabaceae) and have TOs and a DNO. The larvae have an obligate association with the ant *Crematogaster melanogaster* (Clark & Dickson 1956; Schlosz & Brinkman 1991).

*T. sardonyx sardonyx* (Trimen, 1868): King Copper {current RL – LC} [WC; EC; NC; FS] [BUs: SK, NK, AT, SAV]

*T. sardonyx peringueyi* (Dickson, 1969): Namaqua King Copper {current RL – LC} [WC (SA)] [BUs: FY, SK]

**Genus *Phasis*** Hübner, 1819. An endemic South African genus with 4 species. The larvae are herbivorous (*Searsia* (= *Rhus*), Anacardiaceae, and *Melianthus*, Melianthaceae) and possess TOs (all instars) and a DNO (third and subsequent instars). The larvae have an obligate association with *Crematogaster* ants (mainly *C. peringueyi*).

*P. braueri* Dickson, 1968: Brauer's Arrowhead {current RL – LC} [WC; EC (SA)] [BUs: AT, SK]

*P. clavum clavum* Swanepoel, 1953: Namaqua Arrowhead {current RL – LC} [NC; WC (SA)] [BUs: FY, SK]

*P. clavum erythema* Quickelberge, 1980: Roggeveld Arrowhead {current RL – LC} [NC (SA)] [BU: FY]

*P. pringlei* Dickson, 1977: Pringle's Arrowhead [RDB 89 – R; RL 95 – I] {current RL – LC} [NC (SA)] [BU: FY]

*P. thero thero* (Linnaeus, 1764): Silver Arrowhead {current RL – LC} [WC (SA)] [BUs: FY, SK]

*P. thero cedarbergae* Dickson & Wykeham, 1974: Cedarberg Arrowhead [RDB 89 – R; RL 95 – I] {current RL – LC} [WC (SA)] [BU: FY]

**THECLINI** Swainson, 1830. With 286 Afrotropical species (391 taxa).

**Subtribe *Amblypodiina*** Doherty, 1886. Larvae are herbivorous. The larvae have TOs and a DNO. Facultative association with ants.

**Genus *Myrina*** Fabricius, 1807. A widely distributed, endemic Afrotropical genus with 5 species (13 taxa).

*M. dermaptera dermaptera* (Wallengren, 1857): Lesser Fig-tree Blue {current RL – LC} [EC; KZN; SW; M; LP] [BUs: IOCB, SAV and ecotone with FO]

*M. silenus ficedula* Trimen, 1879: Common Fig-tree Blue {current RL – LC} [WC; EC; KZN; SW; FS; M; LP; G; NW] [BUs: IOCB, SAV, FY, GR and ecotones with FO]

*M. silenus penningtoni* Dickson & Stephen, 1971: Namaqualand Fig-tree Blue {current RL – LC} [NC; WC (SA)] [BUs: SK, FY]

**Subtribe *Iolaina*** Riley, 1958

**Genus *Iolais*** Hübner, 1819. A widespread and speciose endemic Afrotropical genus with 123 species. One species also found extraliminally. All the studied larvae are herbivorous and have TOs as well as a DNO. They have a facultative ant association. Ants (often *Crematogaster*) are sometimes found with larvae intermittently. The larvae are, however, not obligated to the ants (Heath & Claassens 2003).

**Subgenus *Epamera*** Druce, 1891.

*I. (E.) aemulus aemulus* Trimen, 1895: Short-barred Sapphire {current RL – LC} [KZN; EC (SA)] [BUs: AT, IOCB]

*I. (E.) alienus alienus* Trimen, 1898: Brown-line Sapphire {current RL – LC} [KZN; SW; M; LP; G; NW] [BU: SAV]

*I. (E.) aphnaeoides* Trimen, 1873: Yellow-banded Sapphire [RDB 89 – R] {current RL – LC} [EC (SA)] [BUs: FO, IOCB]

*I. (E.) diametra natalica* Vári, 1976: Natal Yellow-banded Sapphire [RDB 89 – R] {current RL – LC} [KZN (SA)] [BU: SAV]

*I. (E.) mimosae mimosae* (Trimen, 1874): Southern Mimosa Sapphire {current RL – LC} [WC; EC (SA)] [BUs: AT, SK]

*I. (E.) mimosae rhodosense* (Stempffer & Bennett, 1959): Zimbabwe Mimosa Sapphire {current RL – LC} [KZN, SW; M; LP; G; NW; NC] [BU: SAV]

*I. (E.) nasisii* (Riley, 1928): Zimbabwe Yellow-banded Sapphire {current RL – LC} [LP] [BU: SAV]

*I. (E.) sidus* Trimen, 1864: Red-line Sapphire {current RL – LC} [EC; KZN; SW; M; LP] [BUs: AT, IOCB, SAV]

**Subgenus *Aphniolaus*** Druce, 1902.

*I. (A.) pallene* (Wallengren, 1857): Saffron Sapphire {current RL – LC} [KZN; SW; M; LP; G] [BU: SAV]

**Subgenus *Iolaphilus*** Stempffer & Bennett, 1958.

*I. (I.) trimeni* Wallengren, 1875: Trimen's Sapphire {current RL – LC} [KZN; SW; M; LP; G; NW] [BUs: SAV, GR]

**Subgenus *Argiolaus*** Druce, 1891.

*I. (A.) silarus silarus* Druce, 1885: Straight-line Sapphire {current RL – LC} [KZN; SW; M; LP; NW] [BUs: SAV, IOCB]

*I. (A.) silas* (Westwood, 1851): Southern Sapphire {current RL – LC} [EC; KZN] [BUs: AT, IOCB]

**Subgenus *Pseudiolaus*** Riley, 1928.

*I. (P.) lulua* (Riley, 1928): White-spotted Sapphire [RDB 89 – R] {current RL – NT} [KZN (SA)] [BU: IOCB]

**Genus *Stugeta*** Druce, 1891. [Officially raised to generic level by Larsen (2005).]

*S. bowkeri bowkeri* Trimen, 1864: Bowker's Sapphire {current RL – LC} [WC; EC; KZN (SA)] [BUs: FY, AT, SK, NK, SAV]

*S. bowkeri henningi* (Dickson, 1980): Henning's Sapphire {current RL – LC} [NW; G; FS; NC (SA)] [BUs: SAV, GR]

*S. bowkeri tearei* (Dickson, 1980): Teare's Sapphire {current RL – LC} [KZN; SW; M; LP; G; NW] [BU: SAV]

*S. subinfusata reynoldsi* (Dickson, 1980): Dusky Sapphire {current RL – LC} [NC (SA)] [BUs: SK, NK, D, SAV]. Note: also found in Namibia and Botswana.

**Subtribe *Hypolycaenina*** Swinhoe, 1910. The studied larvae are herbivorous. See individual genera for further information. There is a facultative ant association (Heath & Claassens 2003).

**Genus *Hypolycaena*** Felder & Felder, 1862. A genus with 28 Afrotropical species. Genus also found extraliminally. The studied larvae are herbivorous and have a DNO but no TOs. There is a facultative ant association (Heath & Claassens 2003).

*H. buxtoni buxtoni* Hewitson, 1874: Buxton's Hairstreak {current RL – LC} [EC; KZN; SW; M; LP] [BU: IOCB]

*H. lochmophila* Tite, 1967: Coastal Haitstreak [RDB 89 – I] {current RL – LC} [KZN] [BUs: IOCB, FO]

*H. philippus philippus* (Fabricius, 1793): Purple-brown Hairstreak {current RL – LC} [EC; KZN; SW; M; G; LP; NW] [BUs: IOCB, FO, SAV]

**Genus *Hemiolaus*** Aurivillius, 1923. [Raised to generic level by Lees & Minet (2003).]

*H. caeculus caeculus* Hopffer, 1855: Azure Hairstreak {current RL – LC} [SW; M; LP; NW; G] [BU: SAV]

**Genus and subgenus *Leptomyrina*** Butler, 1898. An endemic Afrotropical genus with 9 species. The endophytic herbivorous larvae have a DNO but no TOs (Clark & Dickson 1971; Pringle *et al.* 1994). There is a facultative association with ants (Heath & Claassens 2003).

*L. (L.) hirundo* (Wallengren, 1857): Tailed Black-eye {current RL – LC} [EC; KZN; L; SW; M; LP] [BUs: AT, IOCB, SAV, GR]

**Subgenus *Gonatomyrina*** Aurivillius, 1924.

*L. (G.) gorgias gorgias* (Stoll, 1790): Common Black-eye {current RL – LC} [EC; KZN; SW; M; LP] [BUs: GR, SAV, IOCB]

*L. (G.) henningi* Dickson, 1976: Henning's Black-eye {current RL – LC} [NC; NW; FS; G; LP] [BUs: SAV, GR]

*L. (G.) lara* (Linnaeus, 1764): Cape Black-eye {current RL – LC} [WC; EC; NC; FS; L (SA; L)] [BUs: FY, SK, NK, D, AT, GR, SAV]

**Subtribe *Deudoricina*** Doherty, 1886

**Genus *Deudorix*** Hewitson, 1863. A widespread Afrotropical (91 species), Oriental and Indo-Australian genus. The endophytic herbivorous

larvae have a DNO but no TOs. The larvae have a facultative relationship with ants (Clark & Dickson 1956, 1971; Ackery & Rajan 1990; Pringle *et al.* 1994).

**Subgenus *Virachola*** Moore, 1881.

*D. (V.) antalus* (Hopffer, 1855): Brown Playboy {current RL – LC} [L; SW; all SA provinces] [BUs: all nine]

*D. (V.) dariaves* Hewitson, 1877: Black-and-Orange Playboy {current RL – LC} [KZN; SW; LP; M] [BUs: IOCB, SAV]

*D. (V.) dinochares* Grose-Smith, 1887: Apricot Playboy {current RL – LC} [KZN; SW; M; LP; NW; G] [BUs: IOCB, SAV]

*D. (V.) dinomenes* Grose-Smith, 1887: Orange Playboy {current RL – LC} [KZN] [BU: IOCB]

*D. (V.) diocles* Hewitson, 1869: Orange-barred Playboy {current RL – LC} [EC; KZN; SW; M; LP] [BUs: IOCB, SAV]

*D. (V.) penningtoni* Van Son, 1949: Pennington's Playboy {current RL – LC} [KZN; LP; M] [BUs: IOCB, SAV]

*D. (V.) vansoni* Pennington, 1948: Van Son's Playboy {current RL – LC} [KZN; SW; M] [BUs: IOCB, SAV]

**Genus *Capys*** Hewitson, 1865. A widespread, endemic Afrotropical genus with 16 species. Larvae associated with the plant genus *Protea* (Proteaceae). The endophytic herbivorous larvae have a DNO but no TOs. The larvae have a facultative ant relationship (Heath & Claassens 2003).

*C. alphaeus alphaeus* (Cramer, 1777): Western Orange-banded Protea-butterfly {current RL – LC} [WC; NC; EC (SA)] [BUs: FY, SK]

*C. alphaeus extentus* Quickelberge, 1979: Eastern Orange-banded Protea-butterfly {current RL – LC} [EC; KZN; SW; M; FS; LP (SA; SW)] [BU: GR]

*C. disjunctus disjunctus* Trimen, 1895: Russet Protea-butterfly {current RL – LC} [EC; KZN; SW; M; G; NW; LP] [BUs: GR, IOCB, SAV]

*C. penningtoni* Riley, 1932: Pennington's Protea-butterfly [RDB 89 – R] {current RL: VU B1ab(ii)+2ab(ii)} [KZN (SA)] [BU: GR]

**LYCAENINAE** Leach, 1815. Afrotropical 1 genus and 3 species. In SA and L: 1 genus and 2 species. There are no 'at risk' RL taxa in SA, L and SW.

**Genus *Lycaena*** Fabricius, 1807. Found in many biogeographical regions. Only 3 Afrotropical species. The genus is found mainly in Eurasia and North America (14 species), but a few

species are endemic to tropical America, New Zealand, New Guinea and the Asian tropics (Scott 1997).

*L. clarki* Dickson, 1971: Eastern Sorrel Copper {current RL – LC} [WC; EC; KZN; FS; L; G; NC (SA; L)] [BUs: SK, NK, GR, SAV]. The grounds for this taxon not being *L. orus* are rather shaky (De Jong, pers. comm.).

*L. orus* (Cramer, 1780): Western Sorrel Copper {current RL – LC} [WC; EC (SA)] [BUs: FY, AT]

**POLYOMMATINAE** Swainson, 1827. In SA, L and SW: 23 genera and 128 taxa. There are 16 'at risk' RL taxa in SA, L and SW (= 25.4% of the current RL taxa in South Africa).

**LYCAENESTHINI** Toxopeus, 1929. The herbivorous larvae have TOs as well as a DNO. There is a facultative ant association (Heath & Claassens 2003).

**Genus *Anthene*** Doubleday, 1847. A large and widespread, mainly Afrotropical (137 species) genus.

*A. amarah amarah* (Guérin-Méneville, 1849): Black-striped Hairtail {current RL – LC} [all SA provinces; SW] [BUs: all except D]

*A. butleri livida* (Trimen, 1881): Pale Hairtail {current RL – LC} [SW; all SA provinces but not WC] [BUs: all except D]

*A. contrastata mashuna* (Stevenson, 1937): Mashuna Hairtail {current RL – LC} [all SA provinces; SW] [BUs: SK, NK, SAV, GR]

*A. definitiva definitiva* (Butler, 1899): Common Hairtail {current RL – LC} [all SA provinces; L; SW] [BUs: FY, AT, IOCB, GR, SAV]

*A. juanita* Henning & Henning, 1993: Juanita's Hairtail [RL 95 – R] {current RL – VU B1ab(iv)c(iv)+2ab(iv)c(iv); D1+2} [LP (SA)] [BU: FO]. Very rare, known only from the type locality.

*A. kersteni* (Gerstaecker, 1871): Kersten's Hairtail {current RL – LC} [KZN] [BU: IOCB]

*A. lemnos lemnos* (Hewitson, 1878): Large Hairtail {current RL – LC} [KZN] [BU: IOCB]

*A. lindae* Henning & Henning, 1994: Linda's Hairtail [RL 95 – R] {current RL – VU D2} [NC (SA)] [BU: SAV]. Note: currently known only from the Witsand area of the Northern Cape.

*A. liodes* (Hewitson, 1874): Liodes Hairtail {current RL – LC} [KZN; SW; M; LP] [BUs: IOCB, SAV]

*A. millari* (Trimen, 1893): Millar's Hairtail {current RL – LC} [EC; KZN; G; SW; M; LP] [BUs: AT, IOCB, SAV, GR]

*A. minima* (Trimen, 1893): Little Hairtail [RDB 89 – R] {current RL – LC} [KZN; M; LP] [BUs: SAV, IOCB]

*A. otacilia otacilia* (Trimen, 1868): Otacilia Hairtail {current RL – LC} [WC; EC; KZN; SW; M; LP; NW] [BUs: FY, AT, IOCB, SAV]

*A. princeps princeps* (Butler, 1876): Cupreous Hairtail {current RL – LC} [EC; KZN; FS; M; SW; LP] [BUs: IOCB, SAV, GR]

*A. talboti* Stempffer, 1936: Talbot's Hairtail {current RL – LC} [NC; FS; NW; G; M; LP; SW; KZN] [BU: SAV]

**POLYOMMATINI.** The larvae are herbivorous and possess a DNO (which appears in the second or third instar). The presence of TOs is variable (Heath & Claassens 2003). They usually have four instars. The larvae may have a facultative ant association.

**Genus *Cupidopsis*** Karsch, 1895. A widespread but small, endemic Afrotropical genus with 3 species (5 taxa). The larvae are herbivorous and have TOs as well as a DNO. There is a probable but unconfirmed facultative ant association (Jackson 1937; Clark & Dickson 1971).

*C. cissus cissus* (Godart, 1824): Common Meadow Blue {current RL – LC} [all SA provinces; SW; L] [BUs: all BUs except SK, NK and D]

*C. jobates jobates* (Hopffer, 1855): Tailed Meadow Blue {current RL – LC} [SW; all SA provinces except WC]

[BUs: AT, IOCB, GR, SAV]

**Genus *Pseudonacaduba*** Stempffer, 1944. A small and widespread, endemic Afrotropical genus with 2 species (3 taxa). The larvae are herbivorous. It is not known whether the larvae have a DNO or TOs or what kind of ant association is present (Heath & Claassens 2003).

*P. sichela sichela* (Wallengren, 1857): Dusky Blue {current RL – LC} [EC; KZN; SW; M; LP; G; NW] [BUs: IOCB, SAV]

**Genus *Lampides*** Hübner, 1819. A widespread and monobasic genus. Found through much of the Afrotropical and Indo-Australian regions, as well as southern Europe, Hawaii (Scott 1997) and St Helena (Salmon 2000). The herbivorous larvae have TOs and a DNO. The ant association is facultative (Jackson 1937; Clark & Dickson 1956, 1971).

*L. boeticus* (Linnaeus, 1767): Long-tailed Blue {current RL – LC} [all SA provinces; L; SW] [BUs: all nine]

**Genus *Uranothauma*** Butler, 1895. An endemic Afrotropical genus with 20 species (28 taxa). The studied herbivorous larvae do not have TOs or a DNO. They also do not appear to have any ant association (Jackson 1937; Pringle *et al.* 1994).

*U. nubifer nubifer* (Trimen, 1895): Black Heart {current RL – LC} [KZN; SW; M; LP; G; NW; NC] [BUs: GR, SAV]

**Genus *Cacyreus*** Butler, 1898. An endemic Afrotropical genus with 9 species (10 taxa). *C. marshalli* was introduced into southern Europe just over a decade ago, starting in the Balearic Islands (Brown 1993; Honey 1993; Delmas & Maechler 1999; Asher *et al.* 2001; Maravalhas 2003; Vane-Wright 2003). The herbivorous larvae do not have an ant association. The larvae do not have TOs. The larvae of *Cacyreus lingeus* and *C. virilis* have a DNO, while those of *C. dicksoni*, *C. marshalli* and *C. tespis* do not (Heath & Claassens 2003).

*C. dicksoni* Pennington, 1962: Dickson's Geranium Bronze {current RL – LC} [WC; NC] [BUs: FY, SK]

*C. lingeus* (Stoll, 1782): Bush Bronze {current RL – LC} [WC; EC; KZN; SW; M; FS; G; LP] [BUs: FY, AT, FO, IOCB, SAV]

*C. marshalli* Butler, 1898: Geranium Bronze {current RL – LC} [all SA provinces; L; SW] [BUs: FY, AT, FO, IOCB, SAV, GR]

*C. tespis tespis* (Herbst, 1804) (= *palemon*): Water Bronze {current RL – LC} [L; SW; all SA provinces except NC] [BUs: FY, AT, GR]

*C. virilis* Stempffer, 1936: Mocker Bronze {current RL – LC} [KZN; SW; M; LP; G; NW] [BU: SAV]

**Genus *Harpencyreus*** Heron, 1909. A widespread, endemic, upland Afrotropical genus with 15 species (18 taxa). The studied herbivorous larvae have a DNO but no TOs. There may be a facultative larval ant association (Heath & Claassens 2003).

*H. noquasa* (Trimen, 1887): Marsh Blue {current RL – LC} [EC; KZN; L; SW; M; G] [BU: GR]

*H. notoba* (Trimen, 1868): Salvia Blue {current RL – LC} [WC; EC; NC; FS; G; NW] [BUs: SK, NK, SAV, GR]

*H. tsomo* (Trimen, 1868): Tsomo Blue {current RL – LC} [EC; KZN; FS; L] [BU: GR]

**Genus *Leptotes*** Scudder, 1876. There are 13 Afrotropical species (14 taxa). The genus is also found in Latin America and Asia, and one endemic taxon occurs on the Galapagos Islands (Ackery *et al.* 1995). The herbivorous larvae have TOs as well as a DNO. There may

be a facultative larval ant association (Heath & Claassens 2003).

*L. babaulti* (Stempffer, 1935): Babault's Blue [RDB 89 – I] {current RL – LC} [M; LP] [BUs: GR, SAV, FO, IOCB]

*L. brevidentatus* (Tite, 1958): Short-toothed Blue {current RL – LC} [L; SW; all SA provinces] [BUs: all nine]

*L. jeanneli* (Stempffer, 1935): Jeannel's Blue {current RL – LC} [SW; M; LP] [BUs: GR, SAV, FO]

*L. pirithous pirithous* (Linnaeus, 1767): Common Blue {current RL – LC} [L; SW; all SA provinces] [BUs: all nine]

*L. pulchra* Murray, 1874: Sesbania Blue {current RL – LC} [KZN] [BUs: IOCB, GR (and ecotones with FO)]

**Genus *Tuxentius*** Larsen, 1982. An endemic Afrotropical genus with 10 species (16 taxa). The herbivorous larvae have TOs as well as a DNO. There may be a facultative larval ant association (Heath & Claassens 2003).

*T. calice calice* (Hopffer, 1855): White Pie {current RL – LC} [KZN; SW; M; LP; NW; G] [BU: SAV]

*T. hesperis* (Vári, 1976): Western Pie {current RL – LC} [NC (SA)]. Also most southern part of Namibia. [BU: D]

*T. melaena melaena* (Trimen, 1887): Black Pie {current RL – LC} [SW; all SA provinces except WC] [BUs: AT, IOCB, SAV]

*T. melaena griqua* (Trimen, 1887): Griqua Pie [RDB 89 – R] {current RL – LC} [NC] [BU: SAV]

**Genus *Tarucus*** Moore, 1881. There are 12 Afrotropical species (14 taxa), and 23 species are found elsewhere. The herbivorous larvae have TOs and a DNO. The larvae may have a facultative ant association (Heath & Claassens 2003).

*T. bowkeri bowkeri* (Trimen, 1883): Bowker's Southern Blue {current RL – LC} [KZN; EC (SA)] [BUs: IOCB, GR (and ecotone with FO)]

*T. bowkeri transvaalensis* Quicquelberge, 1972: Bowker's Northern Blue {current RL – LC} [M; LP (SA)] [BU: GR]

*T. sybaris sybaris* (Hopffer, 1855): Dotted Blue {current RL – LC} [EC; KZN; SW; M; LP; FS; G; NW] [BUs: AT, IOCB, GR, SAV, GR]

*T. sybaris linearis* (Aurivillius, 1924): Western Dotted Blue {current RL – LC} [FS; NC] [BUs: NK, GR, SAV]

*T. thespis* (Linnaeus, 1764): Fynbos Blue {current RL – LC} [WC; EC; NC (SA)] [BUs: FY, SK, AT, GR]

**Genus *Zintha*** Eliot, 1973. A small endemic, monobasic Afrotropical genus (3 taxa). The herbivorous larvae have TOs and a DNO. The larval ant association is facultative (Jackson 1937; Clark & Dickson 1971; Pringle *et al.* 1994).

*Z. hintza hintza* (Trimen, 1864): Hintza Blue {current RL – LC} [L; SW; all SA provinces] [BUs: AT, SAV]

**Genus *Zizeeria*** Chapman, 1910. A mainly Afrotropical genus with 2 species (2 taxa). The herbivorous larvae have TOs and a DNO. The larval ant association is probably facultative (Heath & Claassens 2003).

*Z. knysna* (Trimen, 1862): Sooty Blue {current RL – LC} [L; SW; all SA provinces] [BUs: all nine]

**Genus *Zizina*** Chapman, 1910. Of the 3 species in the genus, only 1 is found in the Afrotropical Region. The herbivorous larvae have TOs and a DNO. The larval ant association is probably facultative (Clark & Dickson 1971).

*Z. otis antanossa* (Mabille, 1877): Clover Blue {current RL – LC} [EC; KZN; SW; M; G; LP] [BUs: IOCB, SAV, GR]

**Genus *Actizera*** Chapman, 1910. An endemic Afrotropical genus with 3 species (3 taxa). The herbivorous larvae have TOs and a DNO. The larval ant association is presumably facultative (Clark & Dickson 1956, 1971).

*A. lucida* (Trimen, 1883): Rayed Blue {current RL – LC} [L; SW; all SA provinces] [BUs: FY, AT, IOCB, SAV, NK, FO, GR]

*A. stellata* (Trimen, 1883): Red-Clover Blue {current RL – LC} [EC; FS] [BUs: GR, NK]

**Genus *Zizula*** Chapman, 1910. A small but very widespread monobasic genus found in Africa, an extensive part of the Orient, Australia and the Pacific Islands. The herbivorous larvae have TOs and a DNO. There is a presumed facultative larval ant association (Clark & Dickson 1971; Braby & Woodger 1994).

*Z. hylax* (Fabricius, 1775): Gaika Blue {current RL – LC} [L; SW; all SA provinces] [BUs: all except D and SK]

**Genus *Brephidium*** Scudder, 1876. There are 2 Afrotropical species in this genus and 2 American species, including *B. exilis*. The herbivorous larvae have TOs and a DNO. There is a presumed facultative larval ant association (Clark & Dickson 1971; Atsatt 1981).

*B. metophis* (Wallengren, 1860): Tinktinkie Blue {current RL – LC} [WC; EC; NC; KZN; FS] [BUs: FY, SK, NK, AT, GR, SAV, IOCB]

**Genus *Oraidium*** Bethune-Baker, 1914. A monobasic endemic southern African genus occurring in SA and Zimbabwe. It is not known whether the herbivorous larvae have TOs or a DNO or what the ant association is (Clark & Dickson 1971; Pringle *et al.* 1994).

*O. barberae* (Trimen, 1868): Dwarf Blue {current RL – LC} [WC; EC; NC; KZN; L; FS; G; LP] [BUs: all except FO]

**Genus *Azanus*** Moore, 1881. There are 8 Afrotropical species (9 taxa); the genus extends to India. The herbivorous larvae have TOs and a DNO. The larval ant association is presumably facultative (Jackson 1937; Clark & Dickson 1956, 1971; Pringle *et al.* 1994).

*A. jesous jesous* (Guérin-Méneville, 1849): Topaz-spotted Blue {current RL – LC} [L; SW; all SA provinces] [BUs: all except FO]

*A. mirza* (Plötz, 1880): Mirza Blue {current RL – LC} [EC; KZN; SW; M; LP] [BUs: IOCB, SAV]

*A. moriqua* (Wallengren, 1857): Thorn-tree Blue {current RL – LC} [L; SW; all SA provinces] [BUs: all except FY, SK, FO]

*A. natalensis* (Trimen, 1887): Natal Spotted Blue {current RL – LC} [EC; KZN; SW; M; LP] [BUs: SAV, IOCB]

*A. ubaldus* (Stoll, 1782): Velvet-spotted Blue {current RL – LC} [WC; NC; EC; KZN; SW; G; FS; M; LP; NW] [BUs: FY, SK, AT, NK, GR, SAV]

**Genus *Eicochrysops*** Bethune-Baker, 1924. An endemic Afrotropical genus with 15 species (18 taxa). The herbivorous larvae have TOs and a DNO. The larval ant association is presumably facultative (Clark & Dickson 1956, 1971; Pringle *et al.* 1994).

*E. hippocrates* (Fabricius, 1793): White-tipped Blue {current RL – LC} [EC; KZN; SW; M; LP] [BUs: IOCB, SAV and ecotone with FO]

*E. messapus messapus* (Godart, 1824): Southern Cupreous Blue {current RL – LC} [WC; L; FS; EC (SA; L)] [BUs: FY, AT, SK, NK, GR]

*E. messapus mahallakoena* (Wallengren, 1857): Northern Cupreous Blue {current RL – LC} [NC; EC; FS; NW; G; M; LP; SW; KZN] [BUs: IOCB, SAV, GR]

**Genus *Euchrysops*** Butler, 1900. A mainly Afrotropical genus with 26 species (31 taxa). The herbivorous larvae have TOs and a DNO. The larval ant association is facultative (Lamborn 1914; Jackson 1937; Clark & Dickson 1956, 1971; Pringle *et al.* 1994).

*E. barkeri* (Trimen, 1893): Barker's Smoky Blue {current RL – LC} [EC; KZN; SW; M; LP] [BUs: IOCB, SAV]

*E. dolorosa* (Trimen, 1887): Sabi Smoky Blue {current RL – LC} [EC; KZN; SW; FS; M; LP; G; NW] [BUs: GR, IOCB, SAV]

*E. malathana* (Boisduval, 1883): Common Smoky Blue {current RL – LC} [EC; KZN; SW; FS; M; LP; G; NW] [BUs: IOCB, SAV, GR]

*E. osiris osiris* (Hopffer, 1855): Osiris Smoky Blue {current RL – LC} [KZN; SW; M; G; LP] [BUs: SAV, IOCB]

*E. subpallida* Bethune-Baker, 1923: Ashen Smoky Blue {current RL – LC} [KZN; SW; M; LP] [BU: SAV]

**Genus *Lepidochrysops*** Hedicke, 1923. The most speciose genus of all Afrotropical Lycaenidae genera. Widespread, with 131 species (154 taxa). In South Africa, Lesotho and Swaziland there are 49 species and 4 subspecies; 10 current RL taxa. The larvae are all presumed to be phytopredaceous. They do not appear to possess TOs in any instar. The DNO is noted in the second and subsequent instars. Only 11 life histories have been studied (Heath & Claassens 2003). The larvae are herbivorous in the early instars, becoming entomophagous later. There is an obligate ant association with *Camponotus* ants (Heath & Claassens 2003).

*L. asteris* (Godart, 1824): Brilliant Blue {current RL – LC} [WC; EC; KZN (SA)] [BUs: FY, GR]

*L. australis* Tite, 1964: Southern Blue {current RL – LC} [WC; EC (SA)] [BU: FY]

*L. bacchus* Riley, 1938: Wineland Blue [RDB 89 – R] {current RL – LC} [WC; EC; NC (SA)] [BUs: FY, AT, SK]

*L. badhami* Van Son, 1956: Badham's Blue [RDB 89 – R] {current RL – LC} [NC (SA)] [BU: SK]. Note: there is an undescribed coastal subspecies of this insect from the Northern Cape.

*L. balli* Dickson, 1985: Ball's Blue [RDB 89 – R; RL 95 – I] {current RL – LC} [WC (SA)] [BU: FY]

*L. braueri* Dickson, 1966: Brauer's Blue {current RL – LC} [WC; EC (SA)] [BU: FY]

*L. dukei* Cottrell, 1965: Duke's Blue {current RL – LC} [WC (SA)] [BU: FY]

*L. glauca glauca* (Trimen, 1887): Silvery Blue {current RL – LC} [FS; G; NW; LP; M] [BU: SAV]

*L. grahami* (Trimen, 1893): Graham's Blue {current RL – LC} [EC; L (SA; L)] [BU: GR]

*L. gydoae* Dickson & Wykeham, 1994: Gydo Blue {current RL – LC} [WC (SA)] [BU: FY]

- L. hypopolia* (Trimen & Bowker, 1887): Morant's Blue [RDB 89 – Ex] {current RL – EX} [KZN; NW (SA)] [BU: GR]
- L. ignota* (Trimen, 1887): Zulu Blue {current RL – LC} [KZN; SW; NW; M; LP; G; FS (SA; SW)] [BUs: GR, SAV]
- L. irvingi* (Swanepoel, 1948): Irving's Blue {current RL – VU A3ce; B2ab(i,ii,iii,iv)} [M; SW (SA; SW)] [BU: GR]
- L. jamesi jamesi* Swanepoel, 1971: James's Blue [RDB 89 – R; RL 95 – I] {current RL – LC} [NC; WC (SA)] [BUs: FY, SK]
- L. jamesi claassensi* Dickson, 1982: Claassen's Blue [RDB 89 – R; RL 95 – I] {current RL – LC} [NC (SA)] [BUs: SK, FY]
- L. jefferyi* (Swierstra, 1909): Jeffery's Blue [RDB 89 – R] {current RL – EN A3ce; B1ab(ii,iii)+2ab(ii,iii)} [M (SA)] [BU: GR]
- L. ketsi ketsi* Cottrell, 1965: Ketsi Blue {current RL – LC} [L; all SA provinces except NC (SA; L)] [BUs: FY, SK, NK, GR, AT]. Note: Edge (2005) mentions an undescribed and Vulnerable taxon from the Eastern Knysna Heads and Brak River {current RL – NE} [WC] [BU: FY].
- L. ketsi leucomacula* Henning & Henning, 1994: Margate Blue [RL 95 – I] {current RL – VU A3ce; B2ab(iii); D2} [KZN; EC (SA)] [BU: IOCB]
- L. lerothodi* (Trimen, 1904): Lesotho Blue {current RL – LC} [L; EC; FS (SA; L)] [BU: GR]
- L. letsea* (Trimen, 1870): Free State Blue {current RL – LC} [EC; FS; G; L] [BUs: GR, SAV]
- L. littoralis* Swanepoel & Vári, 1983: Coastal Blue [RDB 89 – R; RL 95 – I] {current RL – LC} [WC (SA)] [BU: FY]. Note: Edge (2005) mentions an undescribed and Vulnerable subspecies of this taxon from near Mossel Bay {current RL – NE} [WC] [BU: FY].
- L. loewensteini* (Swanepoel, 1951): Loewenstein's Blue [RDB 89 – R; RL 95 – I] {current RL – LC} [EC; L (SA; L)] [BU: GR]
- L. lotana* Swanepoel, 1962: Lotana Blue [RDB 89 – V] {current RL – CR B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)} [LP (SA)] [BU: GR]
- L. macgregori* Pennington, 1970: McGregor's Blue {current RL – LC} [NC (SA)] [BU: FY]
- L. methymna methymna* (Trimen, 1862): Monkey Blue {current RL – LC} [WC (SA)] [BU: FY]
- L. methymna dicksoni* Tite, 1964: Dickson's Monkey Blue [RDB 89 – E] {current RL – EX} [WC (SA)] [BU: FY]
- L. oosthuizeni* Swanepoel & Vári, 1983: Oosthuizen's Blue [RDB 89 – R; RL 95 – I] {current RL – LC} [EC; L; FS (SA; L)] [BU: GR]
- L. oreas oreas* Tite, 1964: Peninsula Blue [RDB 89 – R] {current RL – LC} [WC (SA)] [BU: FY]
- L. oreas junae* Dickson, 1974: June's Blue {current RL – LC} [WC (SA)] [BU: FY]
- L. ortygia* (Trimen, 1887): Koppie Blue {current RL – LC} [FS; L; NC; EC; G; M (SA; L)] [BUs: NK, GR]
- L. outeniqua* Swanepoel & Vári, 1983: Outeniqua Blue [RDB 89 – R; RL 95 – I] {current RL – LC} [WC (SA)] [BU: FY]
- L. patricia* (Trimen, 1887): Patrician Blue {current RL – LC} [L; SW; all SA provinces] [BUs: all except FO and D]
- L. penningtoni* Dickson, 1969: Pennington's Blue [RDB 89 – R] {current RL – DD} [NC (SA)] [BU: SK]. No apparent present threat other than climate change.
- L. pephredo* (Trimen, 1889): Estcourt Blue [RDB 89 – R] {current RL – VU B2ab(iii)} [KZN (SA)] [BU: GR]
- L. plebeia plebeia* (Butler, 1898): Twin-spot Blue {current RL – LC} [EC; KZN; SW; M; LP; G; NC; FS] [BUs: SAV, GR, IOCB]
- L. poseidon* Pringle, 1987: Baviaanskloof Blue [RDB 89 – I] {current RL – LC} [EC (SA)] [BU: FY]
- L. praeterita* Swanepoel, 1962: Highveld Blue {current RL – EN A2c; B1ab(iv)+2ab(iv)} [NW; G; FS (SA)] [BU: GR]
- L. pringlei* Dickson, 1982: Pringle's Blue [RDB 89 – R; RL 95 – I] {current RL – LC} [WC (SA)] [BU: FY]
- L. procera* (Trimen, 1893): Potchefstroom Blue {current RL – LC} [NW; G; KZN; M; LP (SA)] [BU: GR]
- L. puncticilia* (Trimen, 1883): Mouse Blue {current RL – LC} [WC; NC (SA)] [BU: FY]
- L. quickelbergei* Swanepoel, 1969: Quickelberge's Blue [RDB 89 – R; RL 95 – I] {current RL – LC} [WC (SA)] [BU: FY]
- L. robertsoni* Cottrell, 1965: Robertson's Blue {current RL – LC} [WC; NC; EC; FS; ??G (SA)] [BUs: FY, SK, GR]
- L. rossouwi* Henning & Henning, 1994: Rossouw's Blue {current RL – VU A3ce; B2ab(iii)} [M (SA)] [BU: GR]
- L. southeyae* Pennington, 1967: Southey's Blue {current RL – LC} [EC (SA)] [BU: NK]
- L. swanepoeli* (Pennington, 1948): Swanepoel's Blue [RDB 89 – R] {current RL – VU A3ce; B1ab(ii,iii)+2ab(ii,iii)} [M; KZN (SA)] [BU: GR]

*L. swartbergensis* Swanepoel, 1969: Swartberg Blue {current RL – LC} [WC (SA)] [BU: FY]

*L. tantalus* (Trimen, 1887): King Blue {current RL – LC} [EC; KZN; SW; G; M; LP (SA; SW)] [BU: GR]

*L. titei* Dickson, 1976: Tite's Blue [RDB 89 – I] {current RL – LC} [WC; NC (SA)] [BU: FY]

*L. trimeni* (Bethune-Baker, 1923): Trimen's Blue {current RL – LC} [WC (SA)] [BU: FY]

*L. vansoni* (Swanepoel, 1949): Van Son's Blue {current RL – LC} [LP] [BU: SAV]

*L. variabilis* Cottrell, 1965: Variable Blue {current RL – LC} [L; SW; all SA provinces except NC] [BUs: FY, SK, NK, GR]

*L. victori* Pringle, 1984: Victor's Blue [RDB 89 – R] {current RL – LC} [EC (SA)] [BU: GR]

*L. wykehami* Tite, 1964: Wykeham's Blue [RDB 89 – I] {current RL – LC} [NC; WC (SA)] [BU: SK]

**Genus *Orachrysops*** Vári, 1986. Endemic genus in South Africa and Lesotho, with 11 species and 1 subspecies. Only two of the life cycles have been studied. The TOs (poorly developed) and the DNO appear in the second and subsequent instars. The early instars are herbivorous on *Indigofera* (Fabaceae). *O. ariadne* has been shown to have an obligate ant association with *Camponotus natalensis* (Lu & Samways 2001). The larvae of *O. niobe* do appear to have an obligate association with the ant *Crematogaster baynei* (Edge, pers. comm. September 2004). Another ant may also be implicated (Edge, pers. comm. 2004).

*O. ariadne* (Butler, 1898): Karkloof Blue [RDB 89 – R; RL 95 – V] {current RL – EN B1ab(iii)+2ab(iii)} [KZN (SA)] [BU: GR]

*O. brinkmani* Heath, 1997: Brinkman's Blue {current RL – LC} [WC (SA)] [BU: FY]

*O. lacrimosa* (Bethune-Baker, 1923): Restless Blue {current RL – LC} [KZN; FS; L; M (SA; L)] [BU: GR]

*O. mijburghi* Henning & Henning, 1994: Mijburgh's Blue {current RL – VU D2} [FS (SA)] [BU: GR]

*O. montanus* Henning & Henning, 1994: Golden Gate Blue [RL 95 – R] {current RL – VU D2} [FS (SA)] [BU: GR]

*O. nasutus nasutus* Henning & Henning, 1994: Southern Nosy Blue {current RL – LC} [EC (SA)] [BU: GR]

*O. nasutus remus* Henning & Henning, 1994: Northern Nosy Blue {current RL – LC} [KZN; L (SA; L)] [BU: GR]

*O. niobe* (Trimen, 1862): Brenton Blue [RDB 89 – V; RL 95 – EN] {current RL – CR B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v); C2a(ii)} [WC (SA)] [BU: FY]

*O. regalis* Henning & Henning, 1994: Royal Blue {current RL – LC} [LP; M (SA)] [BU: GR]

*O. subravus* Henning & Henning, 1994: Grizzled Blue {current RL – LC} [KZN; EC (SA)] [BU: GR]

*O. violescens* Henning & Henning, 1994: Violescent Blue {current RL – LC} [M; LP (SA)] [BU: GR]

*O. warreni* Henning & Henning, 1994: Warren's Blue [RL 95 – R] {current RL – LC} [M (SA)] [BU: GR]

**Genus *Chilades*** Moore, 1881. A genus with 12 species, with broad allopatric ranges: Afrotropical (including Madagascar), Eastern Mediterranean region, Arabia and Indo-Australian region. The larvae of *C. trochylus* are herbivorous and have TOs as well as a DNO. Larval ant association is probably facultative (Clark & Dickson 1971).

*C. trochylus* (Freyer, 1843): Grass Jewel Blue {current RL – LC} [L; SW; all SA provinces] [BUs: all except D, SK and FO (but is found in ecotone at forest margins)]

## HESPERIOIDEA Latreille, 1809 (Skippers)

**HESPERIIDAE** Latreille, 1809. There are 525 species in the Afrotropical Region (Larsen 2005). In SA, L and SW: 32 genera with 96 species (14.3% of total species); 11 additional subspecies (107 taxa); 92 taxa have Least Concern status and 11 are Data Deficient. Endemicity: 1 genus, 22 species and 7 subspecies. In this family there are 4 proposed 'at risk' RL taxa in SA, L and SW (= 6.3% of the current RL taxa in South Africa).

**COELIADINAE** Evans, 1937. With 19 species in Africa (Larsen 2005). In SA, L and SW: 1 genus with 6 species and no additional subspecies. There are no 'at risk' RL taxa from SA, L and SW.

**Genus *Coeliades*** Hübner, 1818. With 17 Afrotropical species.

*C. anchises anchises* (Gerstaecker, 1871): One-pip Policeman [RDB 89 – R] {current RL – DD} [KZN; SW; M; L; LP]. Sparse, vagrant/resident, in SA at fringe of geographic range. [BUs: FO, SAV, IOCB]

*C. forestan forestan* (Stoll, 1782): Striped Policeman {current RL – LC} [EC; KZN; SW; M; FS; NW; NC; G; L; LP] [BUs: AT, IOCB, SAV, GR, FO]

*C. keithloa keithloa* (Wallengren, 1857): Red-tab Policeman {current RL – LC} [EC; KZN; SW; M; LP (SA; SW)] [BUs: AT, IOCB, FO]

*C. libeon* (Druce, 1875): Spotless Policeman [RDB 89 – I] {current RL – DD} [EC; KZN: SW; M; LP]. Marginal species, rare migrant. [BUs: IOCB, SAV]

*C. lorenzo* (Evans, 1946): Maputo Policeman {current RL – DD} [KZN; M; LP]. Sparse, resident/vagrant. [BUs: IOCB, FO]

*C. pisistratus* (Fabricius, 1793): Two-pip Policeman {current RL – LC} [KZN; SW; M; FS; NW; G; LP]. Common, resident. [BUs: IOCB, SAV, GR, FO]

**PYRGINAE** Burmeister, 1878. In SA, L and SW: 13 genera, 35 species and 4 additional subspecies. There are no proposed 'at risk' RL taxa from SA, L and SW.

**Genus *Celaenorrhinus*** Hübner, 1819. An extensive genus of the Afrotropical (39 species), Neotropical and Oriental Regions (more than 90 species). Some species are sexually dimorphic.

*C. mokeezi mokeezi* (Wallengren, 1857): Western Large Flat {current RL – LC} [EC; KZN (SA)] [BUs: FO, IOCB]

*C. mokeezi separata* (Strand, 1911): Eastern Large Flat {current RL – LC} [KZN; SW; M; LP] [BU: FO]

**Genus *Tagiades*** Hübner, 1819. An Afrotropical (3 species), Oriental and Indo-Australian genus.

*T. flesus* (Fabricius, 1781): Clouded Flat {current RL – LC} [EC; KZN; SW; M; LP] [BUs: AT, FO, IOCB, SAV]

**Genus *Eagris*** Guenée, 1862. An endemic Afrotropical genus with 10 species.

*E. nottoana nottoana* (Wallengren, 1857): Northern Rufous-winged Flat {current RL – LC} [EC; KZN; SW; M; LP] [BUs: FO, IOCB]

*E. nottoana knysna* Evans, 1947: Southern Rufous-winged Flat {current RL – LC} [WC; EC (SA)] [BUs: FO, AT]

**Genus *Calleagris*** Aurivillius, 1925. An endemic Afrotropical genus with 6 species.

*C. kobela* (Trimen, 1864): Mrs Raven's Flat {current RL – LC} [EC; KZN (SA)] [BU: FO]

*C. krooni* Vári, 1974: Kroon's Flat {current RL – LC} [LP; M (SA)] [BU: FO]

**Genus *Eretis*** Mabille, 1891. An endemic Afrotropical species genus with 11 species.

*E. djaelaelae* (Wallengren, 1857): Marbled Elf {current RL – LC} [EC; KZN; SW; M; FS; G; LP] [BUs: AT, IOCB, FO, SAV]

*E. umbra umbra* (Trimen, 1862): Small Marbled Elf {current RL – LC} [all SA provinces; L; SW] [BUs: FY, AT, IOCB, GR, SAV]

**Genus *Sarangesa*** Moore, 1881. A chiefly Afrotropical (23 species) genus, with 2 species (including the type) being Asiatic.

*S. motozi* (Wallengren, 1857): Forest Elfin {current RL – LC} [EC; KZN; SW; M; LP] [BUs: FO, IOCB, AT, SAV]

*S. phidyle* (Walker, 1870): Small Elfin {current RL – LC} [EC; KZN; SW; M; LP; G; NW] [BUs: FO, AT, IOCB, SAV]

*S. ruona* Evans, 1937: Ruona Elfin [RDB 89 – R; RL 95 – I] {current RL – LC} [KZN; M; LP] [BUs: IOCB, FO, SAV]

*S. seineri seineri* Strand, 1909: Northern Dark Elfin {current RL – LC} [M; NW; LP; G] [BUs: SAV, FO]

*S. seineri durbana* Evans, 1937: Southern Dark Elfin {current RL – LC} [KZN; SW; M (SA; SW)] [BUs: IOCB, FO, SAV]

**Genus *Caprona*** Wallengren, 1857. An Afrotropical (3 species) and Oriental (3 species) genus.

*C. pillaana* Wallengren, 1857: Ragged Skipper {current RL – LC} [KZN; M; SW; LP; G; NC; NW; FS] [BUs: SAV, IOCB]

**Genus *Netrobalane*** Mabille, 1903. An endemic (monotypic) Afrotropical genus.

*N. canopus* (Trimen, 1864): Buff-tipped Skipper {current RL – LC} [EC; KZN; SW; M; LP] [BUs: AT, FO, IOCB, SAV]

**Genus *Leuchochitonea*** Wallengren, 1857. A small, endemic Afrotropical genus with 3 species.

*L. levubu* Wallengren, 1857: White-cloaked Skipper {current RL – LC} [KZN; SW; M; LP; G; NW; FS; NC] [BUs: SAV, IOCB]

**Genus *Abantis*** Hopffer, 1855. An endemic Afrotropical genus with 23 species.

*A. bicolor* (Trimen, 1864): Bicoloured Skipper [RDB 89 – R] {current RL – DD} [EC; KZN (SA)] [BUs: FO, IOCB]

*A. paradisea* (Butler, 1870): Paradise Skipper {current RL – LC} [KZN; SW; M; LP; G] [BUs: IOCB, SAV]

*A. tettensis* Hopffer, 1855: Spotted Velvet Skipper {current RL – LC} [KZN; M; LP; G; NW; FS; NC] [BUs: SAV, IOCB]

*A. venosa* Trimen, 1889: Veined Skipper {current RL – LC} [KZN; SW; M; LP] [BUs: FO, SAV, IOCB]

**Genus *Spialia*** Swinhoe, 1912. Small skippers, mainly Afrotropical (21 species) but also Eurasian.

*S. agylla agylla* (Trimen, 1889): Grassveld Sandman {current RL – LC} [WC; EC; NC; L; FS; M; G; NW] [BUs: NK, SK, AT, FY, GR, SAV]

*S. agylla bamptoni* Vari, 1976: Strandveld Sandman = proposed common name, descriptive of the biome of occurrence (from Milton *et al.* 1997) {current RL – LC} [WC; NC (SA)] [BU: SK]

*S. asterodia* (Trimen, 1864): Star Sandman {current RL – LC} [all SA provinces; L; SW] [BUs: SAV, GR, FY, AT, SK, NK]

*S. colotes transvaaliae* (Trimen, 1889): Bushveld Sandman {current RL – LC} [SW; M; LP; G; NW] [BU: SAV]

*S. confusa confusa* (Evans, 1937): Confusing Sandman [RDB 89 – R; RL 95 – I] {current RL – LC} [KZN; SW; M; LP] [BUs: IOCB, SAV, FO]. Rare and localised.

*S. delagoae* (Trimen, 1898): Delagoa Sandman {current RL – LC} [KZN; SW; M; LP; G; NW] [BUs: SAV, FO, IOCB]

*S. depauperata australis* de Jong, 1978: Wandering Sandman {current RL – LC} [KZN; SW; M; LP] [BUs: SAV, GR]

*S. diomus ferax* (Wallengren, 1863): Common Sandman {current RL – LC} [all SA provinces; L; SW] [BUs: all nine]

*S. dromus* (Plötz, 1884): Forest Sandman {current RL – LC} [EC; KZN; SW; M; G; FS; NW; LP] [BUs: AT, IOCB, SAV]

*S. mafa mafa* (Trimen, 1870): Mafa Sandman {current RL – LC} [all SA provinces; L; SW] [BUs: FY, SK, NK, SAV, GR]

*S. nanus* (Trimen & Bowker, 1889): Dwarf Sandman {current RL – LC} [WC; EC; FS; NW; NC] [BUs: FY, SK, NK]

*S. paula* (Higgins, 1924): Mite Sandman [RDB 89 – I] {RL 05 – LC} [NC; FS; G; NW; LP] [BUs: SAV, GR]

*S. satespes* (Trimen, 1864): Boland Sandman {current RL – LC} [WC; EC; NC (SA)] [BUs: FY, AT, SK]

*S. secessus* (Trimen, 1891): Wolkberg Sandman {current RL – LC} [KZN; SW; M; LP] [BUs: SAV, GR]

*S. spio* (Linnaeus, 1764): Mountain Sandman {current RL – LC} [all SA provinces; L; SW] [BUs: all except D]

**Genus *Gomalia*** Moore, 1879. A genus with 2 species, found in Africa and India.

*G. elma elma* (Trimen, 1862): Green-marbled Sandman {current RL – LC} [all SA provinces; L; SW] [BUs: SAV, FY, AT, IOCB, SK, NK, GR, FO]

**Genus *Alenia*** Evans, 1935. An endemic southern African genus (2 species) from southern Namibia and the NC, WC and EC of South Africa.

*A. sandaster* (Trimen, 1868): Karoo Sandman {current RL – LC} [WC; EC; NC (SA)] [BUs: NK, SK, AT]

*A. namaqua* Vári, 1974: Namaqua Sandman {current RL – LC} [WC; NC (SA)]; also just into southern Namibia [BU: SK]

**HETEROPTERINAE** Aurivillius, 1925 (1879). In SA, L and SW: 3 genera, 11 species and 3 additional subspecies. In the opinion of De Jong (pers. comm. 2004), in the Afrotropical Region, only *Metisella* and *Hovala* (from Madagascar) belong to the Heteroptera. *Lepella* and *Tsitana* belong to an Afro-Oriental subgroup of the Hesperinae, the *Astictopterus* group, that in time may be raised to subfamily status itself. The *status quo* is maintained in this study. There is 1 proposed 'at risk' RL taxon in this subfamily in SA, L and SW (= 1.6% of the total of current RL taxa in South Africa).

**Genus *Metisella*** Hemming, 1934. An endemic Afrotropical genus with 23 species.

*M. aegipan aegipan* (Trimen, 1868): Mountain Sylph {current RL – LC} [EC; L; FS; KZN; M; LP; NW (SA; L)] [BU: GR]

*M. malgacha malgacha* (Boisduval, 1833): Grassveld Sylph {current RL – LC} [WC; EC; NC; FS; NW; G; M; KZN; L (SA; L)] [BUs: FY, SK, NK, GR]. Note: there is at least one undescribed subspecies of this taxon from the arid southwestern part of the Northern Cape.

*M. malgacha orina* Vári, 1976: Drakensberg Grassveld Sylph {current RL – LC} [KZN; L; M; EC (SA; L)] [BU: GR]

*M. meninx* (Trimen, 1873): Marsh Sylph [RDB 89 – I] {current RL – VU A3ce} [KZN; FS; M; G; NW (SA)] [BU: GR]

*M. metis metis* (Linnaeus, 1764): Western Gold-spotted Sylph {current RL – LC} [WC (SA)] [BUs: FO, FY]

*M. metis paris* Evans, 1937: Eastern Gold-spotted Sylph {current RL – LC} [WC; EC; KZN; SW; M; LP] [BUs: FO, AT, IOCB, SAV]

*M. syrinx* (Trimen, 1868): Bamboo Sylph [RDB 89 – R] {current RL – LC} [EC; FS; KZN; L (SA; L)] [BU: GR]

*M. willemi* (Wallengren, 1857): Netted Sylph {current RL – LC} [M; G; NW; LP] [BUs: SAV, GR]

**Genus *Tsitana*** Evans, 1937. An endemic, mainly South African, Afrotropical genus with 5 described species. A revision (by Ball) of the taxa is in progress.

*T. dicksoni* Evans, 1956: Dickson's Sylph [RDB 89 – R] {current RL – DD} [WC (SA)] [BU: FY]. It is believed that this skipper has undergone serial misidentification. Ball is involved with a revision of the genus. *T. dicksoni* is rare and appears to have a very limited distribution in the Franschoek Pass and Klein Drakenstein Mountains.

*T. tsita* (Trimen, 1870): Dismal Sylph {current RL – LC} [EC; KZN; L; FS; M; G; NW; LP] [BUs: GR, IOCB, SAV]

*T. uitenhaga* Evans, 1937: Uitenhage Sylph {current RL – LC} [WC; EC (SA)] [BUs: AT, SK]

*T. tulbagha tulbagha* Evans, 1937: Western Tulbagh Sylph {current RL – LC} [WC; NC (SA)] [BUs: FY, SK]

*T. tulbagha kaplani* Dickson, 1976: Eastern Tulbagh Sylph {current RL – LC} [WC; EC (SA)] [BU: FY]

**Genus *Astictopterus*** C. & R. Felder, 1860. Mainly Afrotropical (7 species) genus, also 1 Oriental and type species.

*A. inornatus* (Trimen, 1864): Modest Sylph {current RL – LC} [EC; KZN (SA)] [BUs: FO, IOCB]

**HESPERIINAE** Latreille, 1809. In SA, L and SW: 15 genera, 44 species and 4 additional subspecies. There are 3 proposed 'at risk' RL taxa in SA, L and SW (= 4.8% of the current RL taxa in South Africa).

**Genus *Kedestes*** Watson, 1893. A speciose, endemic Afrotropical genus with 24 species.

*K. barberae barberae* (Trimen, 1873): Barber's Ranger {current RL – LC} [EC; L; FS; KZN; M; LP; G] [BUs: AT, SAV, GR]

*K. barberae bonsa* Evans, 1956 Barber's Karoo Ranger {current RL – LC} [EC; FS; NC (SA)] [BU: GR]

*K. barberae bunta* Evans, 1956: Barber's Cape Flats Ranger {current RL – CR A2ce; B1ab (i,ii,iii,iv,v) + 2ab(i,ii,iii,iv,v), D} [WC (SA)] [BU: FY]

*K. callicles* (Hewitson, 1868): Pale Ranger {current RL – LC} [KZN; SW; M; G; LP] [BUs: IOCB, FO, SAV]

*K. chaca* (Trimen, 1873): Shaka's Ranger {current RL – LC} [EC; KZN (SA)] [BU: GR]

*K. lenis lenis* Riley, 1932: False Bay Unique Ranger {current RL – EN A2ce; B1ab(i,ii,iii,iv,v) + 2ab(i,ii,iii,iv,v), D} [WC (SA)] [BU: FY]

*K. lenis alba* Henning, Henning, Joannou & Woodhall, 1997: Eastern Unique Ranger {current RL – LC} [EC; KZN; L; FS (SA; L)] [BU: GR]

*K. lepenula* (Wallengren, 1857): Chequered Ranger {current RL – LC} [EC; NC; FS; NW; LP; G] [BUs: GR, SAV, AT]

*K. macomo* (Trimen, 1862): Macomo Ranger {current RL – LC} [EC; KZN; SW; M; G; LP] [BUs: AT, IOCB, SAV, FO, GR]

*K. mohozutza* (Wallengren, 1857): Fulvous Ranger {current RL – LC} [EC; KZN; M; SW; G; NW] [BUs: GR, AT]

*K. nerva nerva* (Fabricius, 1793): Scarce Ranger {current RL – LC} [KZN; FS; M; LP; NW; G (SA)] [localised in BUs: GR, SAV]

*K. niveostriga niveostriga* (Trimen, 1864): Dark Ranger {current RL – LC} [EC; KZN; L (SA; L)] [BUs: GR, IOCB, SAV]

*K. niveostriga schloszi* Pringle & Schlosz, 1997: Greyton Dark Ranger {current RL – DD} [WC (SA)] [BU: FY]

*K. sarahae* Henning & Henning, 1998: Sarah's Ranger {current RL – DD} [WC (SA)] [BU: FY]

*K. wallengrenii wallengrenii* (Trimen, 1883): Wallengren's Ranger {current RL – LC} [KZN; SW; M; FS; G; LP] [BUs: GR, SAV]

**Genus *Acada*** Evans, 1937. With 2 Afrotropical species.

*A. biseriata* (Mabille, 1893): Axehead Skipper {current RL – DD} [LP] [BU: SAV (*Brachystegia* woodland)]. Note: this taxon has a marginal distribution in South Africa.

**Genus *Parosmodes*** Holland, 1896. A widespread but poorly speciose Afrotropical genus with 3 species.

*P. morantii morantii* (Trimen, 1873): Morant's Orange {current RL – LC} [KZN; SW; M; G; LP] [BUs: IOCB, FO, SAV]

**Genus *Acleros*** Mabille, 1887. A widespread but poorly speciose Afrotropical genus with 8 species.

*A. mackenii* (Trimen, 1868): Macken's Dart {current RL – LC} [EC; KZN; SW; M; LP] [BUs: FO, IOCB, SAV]

**Genus *Andronymus*** Holland, 1896. An endemic Afrotropical genus with 10 species.

*A. neander neander* (Plötz, 1884): Nomad Dart {current RL – LC} [KZN; G; M; LP] [BUs: SAV, FO]

*A. caesar philander* (Hopffer, 1855): White Dart [RDB 89 – I] {RL 05 – LC} [LP; M] [BUs: SAV, FO]

**Genus *Moltena*** Evans, 1937. An endemic, monobasic southern African genus (EC to southern Mozambique).

*M. fiara* (Butler, 1870): Strelitzia-tree Night-fighter {current RL – LC} [EC; KZN] [BUs: AT, IOCB, FO]

**Genus *Zophopetes*** Mabille, 1904. An endemic, poorly speciose Afrotropical genus with 5 species.

*Z. dysmephila* (Trimen, 1868): Palm-tree Night-fighter {current RL – LC} [WC; EC; KZN; SW; M; LP] [BUs: AT, IOCB, SAV, FY (repeated reintroductions in urban Cape Town)]

**Genus *Artitropa*** Holland, 1896. A widespread, endemic Afrotropical genus with 9 species.

*A. erinnys erinnys* (Trimen, 1862): Bush Night-fighter {current RL – LC} [EC; KZN; SW; M; LP] [BUs: AT, IOCB, FO]

**Genus *Fresna*** Evans, 1937. A widespread, endemic Afrotropical *Acraea*-like genus with 6 species.

*F. nyassae* (Hewitson, 1878): Variegated *Acraea* Hopper {current RL – DD} [KZN; LP] [BUs: SAV, IOCB, FO]

**Genus *Platylesches*** Holland, 1896. A widespread, endemic Afrotropical genus with 20 species.

*P. ayresii* (Trimen, 1889): Peppered Hopper {current RL – LC} [KZN; SW; M; G; LP; NW] [BUs: GR, SAV]

*P. dolomitica* Henning & Henning, 1997a: Dolomite Hopper RDB {current RL – VU D2} [NW; G; M (SA)] [BU: SAV]

*P. galesa* (Hewitson, 1877): White-tail Hopper {current RL – LC} [M; LP] [BUs: SAV, FO]

*P. moritili* (Wallengren, 1857): Honey Hopper {current RL – LC} [KZN; SW; M; G; LP] [BUs: IOCB, SAV, FO]

*P. neba* (Hewitson, 1877): Flower-girl Hopper {current RL – LC} [KZN; SW; M; G; LP] [BUs: IOCB, SAV, FO]

*P. picanini* (Holland, 1894): Banded Hopper {current RL – LC} [M; LP] [BUs: FO, SAV]

*P. robustus robustus* Neave, 1910: Robust Hopper {current RL – LC} [KZN; SW; M; LP] [BUs: IOCB, SAV, FO]

*P. tina* Evans, 1937: Small Hopper [RDB 89 – R] {current RL – DD} [M; LP] [BUs: SAV, GR]

**Genus *Zenonia*** Evans, 1935. A small, widespread, endemic Afrotropical genus with 3 species.

*Z. zeno* (Trimen, 1864): Orange-spotted Hopper {current RL – LC} [EC; KZN; SW; M; LP] [BUs: IOCB, FO, SAV]

**Genus *Pelopidas*** Walker, 1870. A widespread Oriental and Indo-Australian genus, with 2 Afrotropical species.

*P. mathias* (Fabricius, 1798): Black-banded Swift {current RL – LC} [EC; KZN; SW; M; G; NW; LP] [BUs: AT, IOCB, FO, SAV]

*P. thrax inconspicua* (Bertoloni, 1850): White-banded Swift {current RL – LC} [L; SW; all SA provinces except NC] [BUs: all except NK, SK and D]

**Genus *Borbo*** Evans, 1949. A widespread Afrotropical (18 species) and Indo-Australian genus.

*B. borbonica borbonica* (Boisduval, 1833): Olive-haired Swift {current RL – LC} [EC; KZN; SW; M; LP; G] [BUs: AT, IOCB, FO, SAV]

*B. detecta* (Trimen, 1893): Rusty Swift {current RL – LC} [KZN; SW; M] [BUs: IOCB, FO, SAV]

*B. fallax* (Gaede, 1916): False Swift {current RL – LC} [KZN; SW; M; LP; G; NW] [BUs: IOCB, FO]

*B. fatuellus fatuellus* (Hopffer, 1855): Long-horned Swift {current RL – LC} [EC; KZN; SW; M; LP] [BUs: AT, IOCB, FO, SAV]

*B. ferruginea dondo* Evans, 1956: Ferrous Swift [RDB 89 – I] {current RL – DD} [KZN] [BUs: IOCB, FO]

*B. gemella* (Mabille, 1884): Twin Swift {current RL – LC} [EC; KZN; SW; M; LP] [BUs: FO, IOCB, SAV]

*B. holtzi* (Plötz, 1883): Variable Swift {current RL – LC} [KZN; SW; M; LP] [BUs: IOCB, SAV]

*B. lugens* (Hopffer, 1855): Lesser-horned Swift {current RL – LC} [KZN] [BU: IOCB]

*B. micans* (Holland, 1896): Marsh Swift [RDB 89 – I] {current RL – LC} [KZN]. Marginal species scarce in SA. [BU: IOCB]

**Genus *Parnara*** Moore, 1881. A widespread Afrotropical (2 species and 5 subspecies), Indo-Australian and Oriental genus.

*P. naso monasi* (Trimen, 1889): Water Watchman {current RL – LC} [KZN; SW; M; LP] [BUs: IOCB, FO, SAV]

**Genus *Gegenes*** Hübner, 1819. Widespread Afrotropical (4 species), Oriental and eastern Palearctic genus.

*G. hottentota* (Latreille, 1824): Marsh Hottentot Skipper [RDB 89 – I] {current RL – LC} [EC; KZN; M; LP; G] [BUs: GR, SAV, IOCB]

*G. niso niso* (Linnaeus, 1764): Common Hottentot Skipper {current RL – LC} [all SA provinces; L; SW] [BUs: FY, AT, IOCB, SAV, NK, SK, GR]

*G. pumilio gambica* (Hoffmansegg, 1804): Dark Hottentot Skipper {current RL – LC} [EC; KZN; SW; M; LP; FS; NW; G] [BUs: GR, SAV, IOCB]





# Photographs and maps

Plate 1



*Telchinia induna salmontana*  
Male upper side



*Telchinia induna salmontana*  
Female upper side



*Telchinia induna salmontana*  
Male underside



Distribution of  
*Telchinia induna salmontana*  
Province: LP



*Dingana clara*  
Male upper side



*Dingana clara*  
Female upper side



*Dingana clara*  
Male underside



Distribution of  
*Dingana clara*  
Province: LP



*Dingana dingana*  
Male upper side



*Dingana dingana*  
Female upper side



*Dingana dingana*  
Male underside



Distribution of  
*Dingana dingana*  
Province: KZN



*Dingana fraterna*  
Male upper side



*Dingana fraterna*  
Female upper side



*Dingana fraterna*  
Male underside



Distribution of  
*Dingana fraterna*  
Province: M

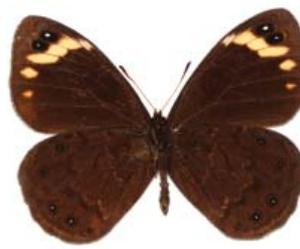
Plate 2



*Dingana jerinae*  
Male upper side



*Dingana jerinae*  
Female upper side



*Dingana jerinae*  
Male underside



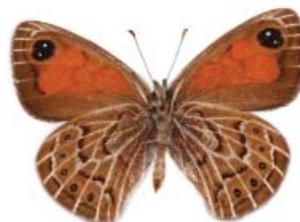
Distribution of  
*Dingana jerinae*  
Province: LP



*Pseudonympha paragaika*  
Male upper side



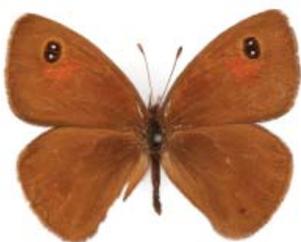
*Pseudonympha paragaika*  
Female upper side



*Pseudonympha paragaika*  
Male underside



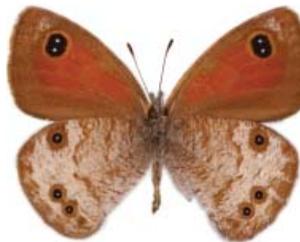
Distribution of  
*Pseudonympha paragaika*  
Province: FS



*Pseudonympha swanepoeli*  
Male upper side



*Pseudonympha swanepoeli*  
Female upper side



*Pseudonympha swanepoeli*  
Male underside



Distribution of  
*Pseudonympha swanepoeli*  
Province: LP



*Stygionympha dicksoni*  
Male upper side



*Stygionympha dicksoni*  
Female upper side



*Stygionympha dicksoni*  
Male underside



Distribution of  
*Stygionympha dicksoni*  
Province: WC

Photos and maps by R.F. Terblanche

Specimens courtesy of the Henning collection

Specimen of *Pseudonympha swanepoeli* (female upper side) courtesy of the Transvaal Museum of Natural History (TM), Pretoria

Plate 3



*Alaena margaritacea*  
Male upper side



*Alaena margaritacea*  
Female upper side



*Alaena margaritacea*  
Male underside



Distribution of  
*Alaena margaritacea*  
Province: LP



*Deloneura immaculata*  
Female upper side



*Deloneura immaculata*  
Female upper sides in the Iziko South African Museum collection, Cape Town



Distribution of  
*Deloneura immaculata*  
Province: EC



*Durbania amakosa albescens*  
Male upper side



*Durbania amakosa albescens*  
Female upper side



*Durbania amakosa albescens*  
Male underside



Distribution of  
*Durbania amakosa albescens*  
Province: KZN



*Durbania amakosa flavida*  
Male upper side



*Durbania amakosa flavida*  
Female upper side



*Durbania amakosa flavida*  
Male underside



Distribution of  
*Durbania amakosa flavida*  
Province: KZN

Photos and maps by R.F. Terblanche  
Specimens courtesy of the Henning collection  
Specimens of *Deloneura immaculata* courtesy of the Iziko South African Museum (SAM), Cape Town

Plate 4



*Durbania amakosa sagittata*  
Male upper side



*Durbania amakosa sagittata*  
Female upper side



*Durbania amakosa sagittata*  
Male underside



Distribution of  
*Durbania amakosa sagittata*  
Province: FS



*Durbaniella clarki belladonna*  
Male upper side



*Durbaniella clarki belladonna*  
Female upper side



*Durbaniella clarki belladonna*  
Male underside



Distribution of  
*Durbaniella clarki belladonna*  
Province: EC



*Aloeides barbarae*  
Male upper side



*Aloeides barbarae*  
Female upper side



*Aloeides barbarae*  
Male underside



Distribution of  
*Aloeides barbarae*  
Province: M



*Aloeides carolynnae aurata*  
Male upper side



*Aloeides carolynnae aurata*  
Female upper side



*Aloeides carolynnae aurata*  
Male underside



Distribution of  
*Aloeides carolynnae aurata*  
Province: WC

Photos and maps by R.F. Terblanche  
Specimens courtesy of the Henning collection  
Specimens of *Aloeides carolynnae aurata* courtesy of the Curle collection. Photos: A. Curle

Plate 5



*Aloeides carolynnae carolynnae*  
Male upper side



*Aloeides carolynnae carolynnae*  
Female upper side



*Aloeides carolynnae carolynnae*  
Male underside



Distribution of  
*Aloeides carolynnae carolynnae*  
Province: WC



*Aloeides clarki*  
Male upper side



*Aloeides clarki*  
Female upper side



*Aloeides clarki*  
Male underside



Distribution of  
*Aloeides clarki*  
Province: EC



*Aloeides dentatis dentatis*  
Male upper side



*Aloeides dentatis dentatis*  
Female upper side



*Aloeides dentatis dentatis*  
Male underside



Distribution of  
*Aloeides dentatis dentatis*  
Province: G



*Aloeides lutescens*  
Male upper side



*Aloeides lutescens*  
Female upper side



*Aloeides lutescens*  
Male underside



Distribution of  
*Aloeides lutescens*  
Province: WC

Plate 6



*Aloeides nubilus*  
Male upper side



*Aloeides nubilus*  
Female upper side



*Aloeides nubilus*  
Male underside



Distribution of  
*Aloeides nubilus*  
Province: M



*Aloeides rossouwi*  
Male upper side



*Aloeides rossouwi*  
Female upper side



*Aloeides rossouwi*  
Male underside



Distribution of  
*Aloeides rossouwi*  
Province: M



*Aloeides stevensoni*  
Male upper side



*Aloeides stevensoni*  
Female upper side



*Aloeides stevensoni*  
Male underside



Distribution of  
*Aloeides stevensoni*  
Province: LP



*Aloeides thyra orientis*  
Male upper side



*Aloeides thyra orientis*  
Female upper side



*Aloeides thyra orientis*  
Male underside



Distribution of  
*Aloeides thyra orientis*  
Province: WC

Plate 7



*Aloicides trimeni southeyae*  
Male upper side



*Aloicides trimeni southeyae*  
Female upper side



*Aloicides trimeni southeyae*  
Male underside



Distribution of  
*Aloicides trimeni southeyae*  
Province: WC



*Capys penningtoni*  
Male upper side



*Capys penningtoni*  
Female upper side



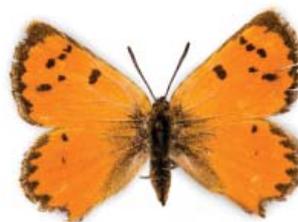
*Capys penningtoni*  
Male underside



Distribution of  
*Capys penningtoni*  
Province: KZN



*Chrysoritis aureus*  
Male upper side



*Chrysoritis aureus*  
Female upper side



*Chrysoritis aureus*  
Male underside



Distribution of  
*Chrysoritis aureus*  
Province: G, M



*Chrysoritis dicksoni*  
Male upper side



*Chrysoritis dicksoni*  
Female upper side



*Chrysoritis dicksoni*  
Male underside



Distribution of  
*Chrysoritis dicksoni*  
Province: WC

Plate 8



*Chrysoritis lyncurium*  
Male upper side



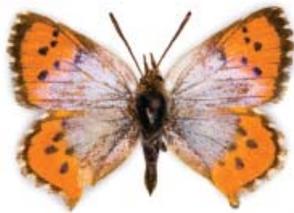
*Chrysoritis lyncurium*  
Female upper side



*Chrysoritis lyncurium*  
Male underside



Distribution of  
*Chrysoritis lyncurium*  
Province: EC, KZN



*Chrysoritis penningtoni*  
Male upper side



*Chrysoritis penningtoni*  
Female upper side



*Chrysoritis penningtoni*  
Male underside



Distribution of  
*Chrysoritis penningtoni*  
Province: EC



*Chrysoritis rileyi*  
Male upper side



*Chrysoritis rileyi*  
Female upper side



*Chrysoritis rileyi*  
Male underside



Distribution of  
*Chrysoritis rileyi*  
Province: WC



*Chrysoritis thysbe mithras*  
Male upper side



*Chrysoritis thysbe mithras*  
Female upper side



*Chrysoritis thysbe mithras*  
Male underside



Distribution of  
*Chrysoritis thysbe mithras*  
Province: WC

Plate 9



*Chrysoritis thysbe schloszae*  
Male upper side



*Chrysoritis thysbe schloszae*  
Female upper side



*Chrysoritis thysbe schloszae*  
Male underside



Distribution of  
*Chrysoritis thysbe schloszae*  
Province: WC



*Chrysoritis thysbe whitei*  
Male upper side



*Chrysoritis thysbe whitei*  
Female upper side



*Chrysoritis thysbe whitei*  
Male underside



Distribution of  
*Chrysoritis thysbe whitei*  
Province: EC



*Chrysoritis trimeni*  
Male upper side



*Chrysoritis trimeni*  
Female upper side



*Chrysoritis trimeni*  
Male underside



Distribution of  
*Chrysoritis trimeni*  
Province: NC



*Erikssonia acraeina*  
Male upper side



*Erikssonia acraeina*  
Female upper side



*Erikssonia acraeina*  
Male underside



Distribution of  
*Erikssonia acraeina*  
Province: LP

Photos and maps by R.F. Terblanche  
Specimens courtesy of the Henning collection  
Specimen of *Chrysoritis thysbe schloszae* (female upper side) courtesy of the Curle collection. Photo: A. Curle

Plate 10



*Trimenia malagrida malagrida*  
Male upper side



*Trimenia malagrida malagrida*  
Female upper side



*Trimenia malagrida malagrida*  
Male underside



Distribution of  
*Trimenia malagrida malagrida*  
Province: WC



*Trimenia malagrida paarlensis*  
Male upper side



*Trimenia malagrida paarlensis*  
Female upper side



*Trimenia malagrida paarlensis*  
Male underside



Distribution of  
*Trimenia malagrida paarlensis*  
Province: WC



*Trimenia wallengrenii gonnemoui*  
Male upper side



*Trimenia wallengrenii gonnemoui*  
Female upper side



*Trimenia wallengrenii gonnemoui*  
Male underside



Distribution of  
*Trimenia wallengrenii gonnemoui*  
Province: WC



*Trimenia wallengrenii wallengrenii*  
Male upper side



*Trimenia wallengrenii wallengrenii*  
Female upper side



*Trimenia wallengrenii wallengrenii*  
Male underside



Distribution of  
*Trimenia wallengrenii wallengrenii*  
Province: WC

Plate 11



*Anthene juanita*  
Male upper side



*Anthene juanita*  
Female upper side



*Anthene juanita*  
Female underside



Distribution of  
*Anthene juanita*  
Province: LP



*Anthene lindae*  
Male upper side



*Anthene lindae*  
Female upper side



*Anthene lindae*  
Male underside



Distribution of  
*Anthene lindae*  
Province: NC



*Lepidochrysops hypopolia*  
Male upper side



*Lepidochrysops hypopolia*  
Male underside



Distribution of  
*Lepidochrysops hypopolia*  
Province: NW, KZN



*Lepidochrysops irvingi*  
Male upper side



*Lepidochrysops irvingi*  
Female upper side



*Lepidochrysops irvingi*  
Male underside



Distribution of  
*Lepidochrysops irvingi*  
Province: M

Photos and maps by R.F. Terblanche

Specimens courtesy of the Henning collection

Specimen of *Anthene juanita* (male upper side) courtesy of the Transvaal Museum of Natural History (TM), Pretoria

Specimens of *Lepidochrysops hypopolia* courtesy of the Iziko South African Museum (SAM), Cape Town

Plate 12



*Lepidochrysops jefferyi*  
Male upper side



*Lepidochrysops jefferyi*  
Female upper side



*Lepidochrysops jefferyi*  
Male underside



Distribution of  
*Lepidochrysops jefferyi*  
Province: M



*Lepidochrysops ketsi leucomacula*  
Male upper side



*Lepidochrysops ketsi leucomacula*  
Female upper side



*Lepidochrysops ketsi leucomacula*  
Male underside



Distribution of  
*Lepidochrysops ketsi leucomacula*  
Province: EC, KZN



*Lepidochrysops lotana*  
Male upper side



*Lepidochrysops lotana*  
Female upper side



*Lepidochrysops lotana*  
Male underside



Distribution of  
*Lepidochrysops lotana*  
Province: LP



*Lepidochrysops methymna dicksoni*  
Male upper side



*Lepidochrysops methymna dicksoni*  
Female upper side



*Lepidochrysops methymna dicksoni*  
Male underside



Distribution of  
*Lepidochrysops methymna dicksoni*  
Province: WC

Photos and maps by R.F. Terblanche

Specimens courtesy of the Henning collection

Specimens of *Lepidochrysops methymna dicksoni* courtesy of the Iziko South African Museum (SAM), Cape Town

Plate 13



*Lepidochrysops pephredo*  
Male upper side



*Lepidochrysops pephredo*  
Female upper side



*Lepidochrysops pephredo*  
Male underside



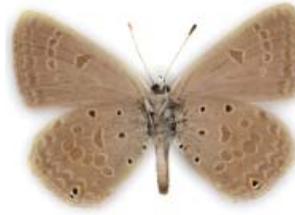
Distribution of  
*Lepidochrysops pephredo*  
Province: KZN



*Lepidochrysops praeterita*  
Male upper side



*Lepidochrysops praeterita*  
Female upper side



*Lepidochrysops praeterita*  
Male underside



Distribution of  
*Lepidochrysops praeterita*  
Province: G, FS, NW



*Lepidochrysops rossouwi*  
Male upper side



*Lepidochrysops rossouwi*  
Female upper side



*Lepidochrysops rossouwi*  
Male underside



Distribution of  
*Lepidochrysops rossouwi*  
Province: M



*Lepidochrysops swanepoeli*  
Male upper side



*Lepidochrysops swanepoeli*  
Female upper side



*Lepidochrysops swanepoeli*  
Male underside



Distribution of  
*Lepidochrysops swanepoeli*  
Province: M, KZN

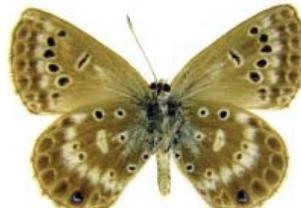
Plate 14



*Orachrysops ariadne*  
Male upper side



*Orachrysops ariadne*  
Female upper side



*Orachrysops ariadne*  
Male underside



Distribution of  
*Orachrysops ariadne*  
Province: KZN



*Orachrysops mijburghi*  
Male upper side



*Orachrysops mijburghi*  
Female upper side



*Orachrysops mijburghi*  
Male underside



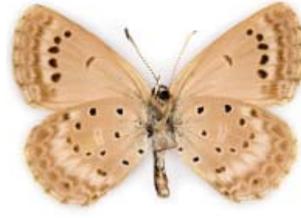
Distribution of  
*Orachrysops mijburghi*  
Province: FS, G



*Orachrysops montanus*  
Male upper side



*Orachrysops montanus*  
Female upper side



*Orachrysops montanus*  
Male underside



Distribution of  
*Orachrysops montanus*  
Province: FS



*Orachrysops niobe*  
Male upper side



*Orachrysops niobe*  
Female upper side



*Orachrysops niobe*  
Male underside



Distribution of  
*Orachrysops niobe*  
Province: WC

Plate 15



*Thestor brachycerus brachycerus*  
Male upper side



*Thestor brachycerus brachycerus*  
Female upper side



*Thestor brachycerus brachycerus*  
Male underside



Distribution of  
*Thestor brachycerus brachycerus*  
Province: WC



*Thestor dicksoni malagas*  
Male upper side



*Thestor dicksoni malagas*  
Female upper side



*Thestor dicksoni malagas*  
Male underside



Distribution of  
*Thestor dicksoni malagas*  
Province: WC



*Thestor protumnus terblanchei*  
Male upper side



*Thestor protumnus terblanchei*  
Female upper side



*Thestor protumnus terblanchei*  
Male underside



Distribution of  
*Thestor protumnus terblanchei*  
Province: FS



*Metisella meninx*  
Male upper side



*Metisella meninx*  
Female upper side



*Metisella meninx*  
Male underside



Distribution of  
*Metisella meninx*  
Province: FS, G, KZN, M, NW

Photos and maps by R.F. Terblanche  
Specimens courtesy of the Henning collection  
Specimen of *Thestor brachycerus brachycerus* (female upper side) photographed by Steve Woodhall

Plate 16



*Kedestes barberae bunta*  
Male upper side



*Kedestes barberae bunta*  
Female upper side



*Kedestes barberae bunta*  
Male underside



Distribution of  
*Kedestes barberae bunta*  
Province: WC



*Kedestes lenis lenis*  
Male upper side



*Kedestes lenis lenis*  
Female upper side



*Kedestes lenis lenis*  
Male underside



Distribution of  
*Kedestes lenis lenis*  
Province: WC



*Platylesches dolomitica*  
Male upper side



*Platylesches dolomitica*  
Female upper side



*Platylesches dolomitica*  
Male underside



Distribution of  
*Platylesches dolomitica*  
Province: G, M, NW

Photos and maps by R.F. Terblanche

Specimens courtesy of the Henning collection

Specimen of *Kedestes lenis lenis* (female upper side) courtesy of the Transvaal Museum of Natural History (TM), Pretoria

Specimen of *Kedestes barberae bunta* (female upper side) courtesy of the Ball collection. Photo: C. Cohen





## References

- ACKERY, P.R. & RAJAN, D. 1990. *A manuscript host-list of the Afrotropical butterflies*. Unpublished list of the Natural History Museum, London.
- ACKERY, P.R., SMITH, C.R. & VANE-WRIGHT, R.I. (eds) 1995. *Carcasson's African butterflies: an annotated catalogue of the Papilionoidea and Hesperioidea of the Afrotropical region*. CSIRO, East Melbourne.
- ACOCKS, J.P.H. 1988. Veld types of South Africa, edn 3. *Memoirs of the Botanical Survey of South Africa* No. 57: 1–146.
- ALLAN, T. 2004. *Evaluation of the taxonomic and habitat status of Kedestes barberae bunta and Kedestes lenis lenis*. Conservation Diploma Project, Cape Technikon.
- ARMSTRONG, A.J. 2002. Insects and the determination of priority areas for biodiversity conservation in KwaZulu-Natal Province, South Africa. *African Entomology* 10,1: 11–27.
- ARMSTRONG, A.J. 2004. Endemic Lepidoptera of conservation concern in KwaZulu-Natal. *Proceedings of the 3rd International Conference on African Lepidoptera*, 19–21 November 2004. North West University, Potchefstroom Campus.
- ASHER, J., WARREN, M., FOX, R., HARDING, P., JEFFCOATE, G. & JEFFCOATE, S. 2001. *The Millennium Atlas of Butterflies in Britain and Ireland*: 1–433. Oxford University Press, Oxford.
- ATSATT, P.R. 1981. Lycaenid butterflies and ants: selection for enemy-free space. *American Naturalist* 118,5: 638–654.
- BALL, J.B. 1994a. The Trail Blazers: historical background to some of the prominent southern African butterfly researchers. In E.L. Pringle, G.A. Henning & J.B. Ball (eds), *Pennington's Butterflies of southern Africa*, edn 2: 21–43. Struik Winchester, Cape Town.
- BALL, J.B. 1994b. Index to common names. In E.L. Pringle, G.A. Henning & J.B. Ball (eds), *Pennington's Butterflies of southern Africa*, edn 2: 787–789. Struik Winchester, Cape Town.
- BALL, J.B. 1994c. Regional round up. *Metamorphosis* 5,3: 93, 94.
- BALL, J.B. 1994d. A new subspecies of *Trimenia wallengrenii* (Trimen & Bowker) (Lepidoptera: Lycaenidae) from the Western Cape Province, South Africa. *Metamorphosis* 5,3: 104–106.
- BALL, J.B. 1994e. A description of three new subspecies of *Durbaniella clarki* (van Son) from the Cape Province. In E.L. Pringle, G.A. Henning & J.B. Ball (eds), *Pennington's Butterflies of southern Africa*, edn 2: 130–133. Struik Winchester, Cape Town.
- BALL, J.B. 1997. A brief history of lepidopterology in southern Africa. *Metamorphosis Occasional Supplement* No. 3: 82–88.
- BALL, J.B. 2006. *Approaches towards a critical evaluation and update of the Red Data List of South African butterflies*. Unpublished M.Sc. thesis, Stellenbosch University, Stellenbosch.
- BAMPTON, I. 1995. A discussion on the larval food of the subfamily Lipteninae (Lepidoptera: Lycaenidae). *Metamorphosis* 6,4: 162–166.
- BEGON, M., TOWNSEND, C.R. & HARPER, J.L. 2006. *Ecology: from individuals to ecosystems*, edn. 4. Blackwell Publishing, Oxford.
- BOERSMA, P.D., KARIEVA, P., FAGAN, W.F., CLARK, J.A. & HOEKSTRA, J.M. 2001. How good are endangered species recovery plans? *BioScience* 51: 643–649.
- BOND, P. & GOLDBLATT, P. 1984. Plants of the Cape flora. A descriptive catalogue. *Journal of South African Botany*, Suppl. Vol. No. 13. National Botanic Gardens of South Africa, Kirstenbosch, Claremont.
- BOND, W.J. & SLINGSBY, P. 1984. Collapse of an ant-plant mutualism: the Argentine ant (*Iridomyrmex humilis*) and myrmecochorous Proteaceae. *Ecology* 65: 1031–1037.
- BRABY, M.F. 2000. *Butterflies of Australia: their identification, biology and distribution*. Volumes 1 & 2: 1–682. CSIRO Publishing, Melbourne.
- BRABY, M.F. & WOODGER, T.A. 1994. The life history of *Zizula hylax attenuata* (T.P. Lucas) (Lepidoptera: Lycaenidae). *Australian Entomologist* 21: 39–42.
- BREDENKAMP, G.J. & BEZUIDENHOUT, H. 1986. *Die plantegroei van die noordelike munisipale gebied van Rodepoort en aangrensende buitestedelike gebiede: 'n ekologiese ondersoek*: 48. Central Publications, Potchefstroom.
- BREDENKAMP, G.J., GRANGER, J.E. & VAN ROOYEN, N. 1998. North-eastern Mountain Grassland. In A.B. Low & A.G. Rebelo (eds), *Vegetation of South Africa, Lesotho and Swaziland*: 46, 47. Department of Environmental Affairs and Tourism, Pretoria.
- BREDENKAMP, G.J. & VAN ROOYEN, N. 1998. Rocky Highveld Grassland. In A.B. Low & A.G. Rebelo (eds), *Vegetation of South Africa, Lesotho and Swaziland*: 39. Department of Environmental Affairs and Tourism, Pretoria.

- BREEN, C.M. & BEGG, G.W. 1989. Conservation status of southern African wetlands. In B.J. Huntley (ed.), *Biotic diversity in southern Africa: concepts and conservation*: 254–263. Oxford University Press, Cape Town.
- BROWN, P. 1993. Geranium assassin flies to Spanish mainland. *New Scientist* 138,7: 1875.
- BURNS, J.M. 2000. *Pyrgus communis* and *Pyrgus albescens* (Hesperiidae: Pyrginae) are separate transcontinental species with variable but diagnostic valves. *Journal of the Lepidopterists' Society* 54,2: 52–71.
- CAMP, K. 1999. *The bioresource groups of KwaZulu-Natal—Mistbelt*. Natural Resource Section, KwaZulu-Natal Department of Agriculture, Cedara.
- CARCASSON, R.H. 1981. *Collins handguide to the butterflies of Africa*. Collins, London.
- CLAASSENS, A.J.M. 1974. Methods employed in the successful rearing, under artificial conditions, of two Cape species of *Lepidochrysops* (Lepidoptera: Lycaenidae). *Journal of the Entomological Society of Southern Africa* 37: 387–392.
- CLAASSENS, A.J.M. 1976. Observations on the myrmecophilous relationships and the parasites of *Lepidochrysops methymna* (Trimen) and *L. trimeni* (Bethune-Baker) (Lepidoptera: Lycaenidae). *Journal of the Entomological Society of Southern Africa* 39: 279–289.
- CLAASSENS, A.J.M. 1995. Observations on the Large White, *Pieris brassicae* (L.) (Lepidoptera: Pieridae), a butterfly which recently established itself in the Western Cape. *Metamorphosis* 6,2: 86–93.
- CLAASSENS, A.J.M. 2000. *Butterflies of the Cape Peninsula: a comprehensive guide*. Tafelberg, Cape Town.
- CLAASSENS, A.J.M. 2005. *Butterflies of the Western Cape: a guide to common garden, park and wayside butterflies*. Sunbird Publishers, Cape Town.
- CLAASSENS, A.J.M. & DICKSON, C.G.C. 1974. The early stages of *Aloeides thyra* (L.) (Lepidoptera: Lycaenidae) with notes on ant association, distribution and general ecology of the species. *Entomologist's Record and Journal of Variation* 86: 253–258.
- CLAASSENS, A.J.M. & DICKSON, C.G.C. 1977. A study of the myrmecophilous behaviour of the immature stages of *Aloeides thyra* (L.) (Lepidoptera: Lycaenidae), with special reference to the function of the retractile tubercles and with additional notes on the general biology of the species. *Entomologist's Record and Journal of Variation* 89: 225–231.
- CLAASSENS, A.J.M. & DICKSON, C.G.C. 1980. *Butterflies of the Table Mountain range*. Struik, Cape Town.
- CLAASSENS, A.J.M. & HEATH, A. 1997. Notes on the myrmecophilous early stages of two species of *Thestor* Hübner (Lepidoptera: Lycaenidae) from South Africa. *Metamorphosis* 8,2: 56–61.
- CLAPHAM, A.R., TUTIN, T.G. & WARBURG, E.F. 1957. *Flora of the British Isles*. Cambridge University Press, Cambridge.
- CLARK, G.C. & DICKSON, C.G.C. 1952. *Some South African butterflies*. Longmans Green, Cape Town.
- CLARK, G.C. & DICKSON, C.G.C. 1956. The honey gland and tubercles of the Lycaenidae. *Lepidoptera News* 10: 225–231.
- CLARK, G.C. & DICKSON, C.G.C. 1960. The life-histories of two species of *Thestor* (Lepidoptera: Lycaenidae). *Journal of the Entomological Society of Southern Africa* 23: 278–283.
- CLARK, G.C. & DICKSON, C.G.C. 1971. *Life histories of the South African lycaenid butterflies*. Purnell, Cape Town.
- CORBET, A.S. & PENDLEBURY, H.M. 1992. *The butterflies of the Malay Peninsula*, edn 4, revised by J.N. Eliot: 1–595. Malayan Nature Society, Kuala Lumpur.
- COTTRELL, C.B. 1965. A study of the *methymna*-group of the genus *Lepidochrysops* Hedicke (Lepidoptera: Lycaenidae). *Memoirs of the Entomological Society of Southern Africa* 9: 1–110.
- COTTRELL, C.B. 1978. Rare and endangered butterflies. Preliminary report on the most important results of a project undertaken in August/September, 1977. Joint Meeting: Threatened Animals and Plants, 9–10 March 1978. Document VIII. *National Programme for Environmental Sciences (Terrestrial Biology Section)* NP 14/106/9.
- COTTRELL, C.B. 1984. Aphytophagy in butterflies: its relationship to myrmecophily. *Zoological Journal of the Linnean Society* 79: 1–57.
- COWLING, R.M. & HOLMES, P.M. 1992. Flora and vegetation. In R.M. Cowling (ed.), *The ecology of fynbos: nutrients, fire and diversity*: 23–61. Oxford University Press, Cape Town.
- COWLING, R.M. & RICHARDSON, D. 1995. *Fynbos: South Africa's unique Floral Kingdom*. Fernwood Press, Vlaeberg, Cape Town.
- CROSSKEY, R.W. & WHITE, G.B. 1977. The Afrotropical Region—a recommended term in zoogeography. *Journal of Natural History* 11: 541–544.
- CURLE, A.I. & CURLE, N.I. 1995. An investigation into the *Pseudonympha varii* species complex (Nymphalidae: Satyrinae) in South Africa. *Metamorphosis* 6: 183–190.
- CURLE, A.I. & HENNING, G.A. 1996. Observations on apparent vertebrate predator damage in the genus *Dingana* (Lepidoptera: Nymphalidae: Satyrinae). *Metamorphosis* 7,1: 24.
- D'ABRERA, B. 1980. *Butterflies of the Afrotropical region*. Lansdowne Editions in association with E.W. Classey, East Melbourne.
- D'ABRERA, B. 1997. *Butterflies of the Afrotropical region. Part I: Papilionidae, Pieridae, Acraeidae, Danaidae & Satyridae*. Hill House Publishers, Victoria.

- DEACON, J. & LANCASTER, N. 1988. *Late Quarternary palaeoenvironments of southern Africa*. Clarendon Press, Oxford.
- DELMAS, S. & MAECHLER, J. 1999. *Catalogue permanent de l'entomofaune. 2 Lepidoptera Rhopalocera*. Union de l'Entomologie Française, Dijon.
- DENNIS, R.L.H. 1993. *Butterflies and climate change*. Manchester University Press, Manchester.
- DENNIS, R.L.H. 2003. Towards a functional resource-based concept for habitat: a butterfly biology viewpoint. *Oikos* 102,2: 417–426.
- DEUTSCHLÄNDER, M.S. & BREDEKAMP G.J. 1999. Importance of vegetation analysis in the conservation management of the endangered butterfly *Aloeides dentatis dentatis* (Swierstra) (Lepidoptera, Lycaenidae) *Koedoe* 42,2: 1–12.
- DE WET, J.I. 1995. The management of the butterfly *Eriksonia acraeina*, Trimen, 1891 (Lepidoptera: Lycaenidae) in the Waterberg. *Metamorphosis* 6,3: 146–148.
- DICKSON, C.G.C. 1953. Recently observed food-plants of some Cape lepidopterous larvae (4th series). *Journal of the Entomological Society of Southern Africa* 15,1: 11–20.
- DICKSON, C.G.C. & KROON, D.M. (eds) 1978. *Pennington's Butterflies of southern Africa*. AD. Donker, Johannesburg.
- DOBSON, J. & GARVIE, O. 2005. A report by the Lepidopterists' Society of Africa on the current status of the South African population of *Eriksonia acraeina* Trimen, 1891 (Lepidoptera: Lycaenidae). *Metamorphosis* 16,3: 67–71.
- DOBSON, R. 2005. Butterfly fauna of the Mpenjati Nature Reserve, KwaZulu-Natal, South Africa. *Metamorphosis* 16,2: 47–52.
- DONNELLY, D. & GILIOME, J.H. 1985. Community structure of epigeaic ants in a pine plantation and newly-burnt fynbos. *Journal of the Entomological Society of Southern Africa* 48: 259–265.
- DU TOIT, A.E. 1972. Kaffraria. In D.J. Potgieter (ed.), *Standard Encyclopaedia of Southern Africa* 6: 267–269. Nasou, CapeTown.
- EDGE, D.A. 1990. Life history—*Aphnaeus hutchinsoni* Trimen, 1887. *Metamorphosis* 1,1: 1–16.
- EDGE, D.A. 2002. Some ecological factors influencing the breeding success of the Brenton Blue butterfly, *Orachrysops niobe* (Trimen) (Lepidoptera: Lycaenidae). *Koedoe* 45,2: 19–34.
- EDGE, D.A. 2005a. Butterfly conservation in the southern Cape. *Metamorphosis* 16,2: 28–46.
- EDGE, D.A. 2005b. *Ecological factors influencing the survival of the Brenton Blue butterfly Orachrysops niobe (Trimen) (Lepidoptera: Lycaenidae)*. Ph.D. thesis, North-West University, South Africa.
- EDGE, D.A. 2007. Re-introduction of the Brenton Blue to Nature's Valley. Unpublished report produced for the Nature's Valley Trust, February 2007.
- EDGE, D.A. 2008a. Environmental management plan: Brenton Blue butterfly special nature reserve, revision 2 (unpublished). CapeNature document, August 2008.
- EDGE, D.A. 2008b. Adult behaviour of *Orachrysops niobe* (Trimen) (Lepidoptera: Lycaenidae). *Metamorphosis* 19,3: 116–126.
- EDGE, D.A., CILLIERS, S.S. & TERBLANCHE, R.F. 2008a. Vegetation associated with the occurrence of the Brenton Blue butterfly. *South African Journal of Science*. 104: 505–510.
- EDGE, D.A. & PRINGLE, E.L. 1996. Notes on the natural history of the Brenton Blue, *Orachrysops niobe* (Trimen) (Lepidoptera: Lycaenidae). *Metamorphosis* 7,3: 109–120.
- EDGE, D.A., ROBERTSON, H.G. & VAN HAMBURG, H. 2008b. Ant assemblages at potential breeding sites for the Brenton Blue butterfly *Orachrysops niobe* (Trimen) (Lepidoptera : Lycaenidae). *African Entomology* 16,2: 253–262.
- EDGE, D.A. & VAN HAMBURG, H. 2009, in press. Larval feeding behaviour and myrmecophily of the Brenton Blue, *Orachrysops niobe* (Trimen) (Lepidoptera: Lycaenidae). *Journal of Research on the Lepidoptera* 42.
- EVANS, W.H. 1937. *A catalogue of the African Hesperidae in the British Museum (Natural History)*. Oxford University Press, Oxford.
- FLEMING, W.A. 1975. *Butterflies of West Malaysia and Singapore*, Vol. 1: 1–54; Vol. 2: 55–90. Claxsey, Farington, Oxon.
- GCIS (Government Communications) 2004. *Pocket guide to South Africa*, edn 2. STE Publishers for Government Communications, Pretoria.
- GEERTSEMA, H. 1996. The Large Cabbage White, *Pieris brassicae*, an exotic butterfly of potential threat to cabbage growers in the Western Cape, South Africa. *Journal of the South African Society of Horticultural Science* 6,1: 31–34.
- GERMISHUIZEN, G., MEYER, N.L., STEENKAMP, Y. & KEITH, M. (eds) 2006. *A checklist of South African plants*. Southern African Botanical Diversity Network Report No. 41. SABONET, Pretoria.
- GERMISHUYS, H. 1982. *Butterflies of southern Africa*. Chris van Rensburg Publications, Johannesburg.
- GIBBS RUSSEL, G.E., WATSON, L., KOEKEMOER, M., SMOOK, L., BARKER, N.P., ANDERSON, H.M. & DALLWITZ, M.J. 1991 (reprinted). Grasses of southern Africa. *Memoirs of the Botanical Survey of South Africa* No. 58. National Botanic Gardens/ Botanical Research Institute, Pretoria.
- HANSKI, I.A. & GILPIN, M.E. 1997. *Metapopulation biology: ecology, genetics and evolution*. Academic Press, San Diego.

- HEATH, A. 1997a. A review of the African genera of the tribe Aphnaeini (Lepidoptera: Lycaenidae). *Metamorphosis, Occasional Supplement 2*: 1–60.
- HEATH, A. 1997b. Myrmecophily and the male genitalia of African Lycaenidae: a preliminary discussion. *Metamorphosis, Occasional Supplement 3*: 89–97.
- HEATH, A. 1998. Further aspects on the life history of the myrmecophilous species *Chrysoritis dicksoni* (Gabriel) (Lepidoptera: Lycaenidae). *Metamorphosis 9,4*: 160–172.
- HEATH, A. 2001. New synonymies and taxonomic notes on the genus *Chrysoritis* Butler (Lepidoptera: Lycaenidae). *Metamorphosis 12,3*: 85–98.
- HEATH, A. 2005. *Chrysoritis* review (Letter to the Editor). *Metamorphosis 16,3*: 87.
- HEATH, A. & BRINKMAN, A.K. 1995. Aspects of the life history, distribution and population fluctuations of *Oxychaeta dicksoni* (Gabriel) (Lepidoptera: Lycaenidae). *Metamorphosis 6,3*: 117–127.
- HEATH, A. & BRINKMAN, A.K. 1996. Notes on the early stages of *Argyrocupha malagrida maryae* (Wallengren) (Lepidoptera, Lycaenidae). *Metamorphosis 6,4*: 167–173.
- HEATH, A. & CLAASSENS, A.J.M. 2000. New observations of ant associations and life history adaptations (Lepidoptera: Lycaenidae) in South Africa. *Metamorphosis 11,1*: 3–19.
- HEATH, A. & CLAASSENS, A.J.M. 2003. Ant-association among southern African Lycaenidae. *Journal of the Lepidopterists' Society 57,1*: 1–16.
- HEATH, A., NEWPORT, M.A. & HANCOCK, D. 2002. *The butterflies of Zambia*. African Butterfly Research Institute and The Lepidopterists' Society of Africa, Pretoria.
- HEATH, A. & PRINGLE, E.L. 2004. A review of the southern African genus *Thestor* Hübner (Lepidoptera: Lycaenidae: Miletinae). *Metamorphosis 15,3*: 91–151.
- HEATH, A. & PRINGLE, E.L. 2007. Biological observations and a taxonomic review based on morphological characters in the myrmecophilous genus *Chrysoritis* Butler (Lepidoptera: Lycaenidae: Aphnaeini). *Metamorphosis 18,1*: 2–44.
- HENNING, G.A. 1988a. Report on the Ruimsig Entomological Reserve—1986. *Metamorphosis 1,21*: 13–16.
- HENNING, G.A. 1988b. Ruimsig Entomological Reserve. *Metamorphosis 1,22*: 9–14.
- HENNING, G.A. 1991. Effective Lepidoptera Conservation. *Metamorphosis 2,4*: 34–35.
- HENNING, G.A. 1992. Phylogenetic notes on the African species of the subfamily Acraeinae—Part 1 (Lepidoptera: Nymphalidae). *Metamorphosis 3,3*: 100–114.
- HENNING, G.A. 1993a. Phylogenetic notes on the African species of the subfamily Acraeinae—Part 2 (Lepidoptera: Nymphalidae). *Metamorphosis 4,1*: 5–18.
- HENNING, G.A. 1993b. Phylogenetic notes on the African species of the subfamily Acraeinae—Part 3 (Lepidoptera: Nymphalidae). *Metamorphosis 4,2*: 53–62.
- HENNING, G.A. 1997. Butterfly conservation in South Africa. *Metamorphosis, Occasional Supplement 3*: 120–128.
- HENNING, G.A. 1998. The conservation status of the Heidelberg Copper butterfly (*Poecilmitis aureus*) in the Heidelberg district. *Metamorphosis 9,3*: 131–134.
- HENNING, G.A. 2001a. Notes on butterfly conservation in South Africa and the IUCN Red Data Book categories. *Metamorphosis 12,2*: 55–68.
- HENNING, G.A. 2001b. Notes on the biology of threatened butterflies in South Africa. *Metamorphosis 12,3*: 109–122.
- HENNING, G.A. & HENNING, S.F. 1988. A review of the genus *Capys* Hewitson (Lepidoptera: Lycaenidae) with descriptions of seven new species and two new subspecies. *Durban Museum Novitates 14,6*: 102–139.
- HENNING, G.A. & HENNING, S.F. 1992a. Conservation of Lepidoptera in southern Africa. In S.E. Woodhall (ed.), *A practical guide to butterflies and moths in southern Africa*: 29–42. Lepidopterists' Society of Southern Africa, Florida Hills, South Africa.
- HENNING, G.A. & HENNING, S.F. 1992b. Reviews of threatened species from southern Africa. In S.E. Woodhall (ed.), *A practical guide to butterflies and moths in southern Africa*: 190–200. Lepidopterists' Society of Southern Africa, Florida Hills, South Africa.
- HENNING, G.A. & HENNING, S.F. 1994. A review of the genus *Orachrysops* Vári (Lepidoptera: Lycaenidae) with descriptions of seven new species and one new subspecies. In E.L. Pringle, G.A. Henning & J.B. Ball (eds), *Pennington's Butterflies of southern Africa*, edn 2: 260–273. Struik-Winchester, Cape Town.
- HENNING, G.A. & HENNING, S.F. 1995. Updating the status of South African Red Data butterfly species. *Metamorphosis 6,2*: 96–98.
- HENNING, G.A. & HENNING, S.F. 1996a. Notes on the *Dingana dingana* species group (Lepidoptera: Nymphalidae: Satyrinae), with description of a new species. *Metamorphosis 7,1*: 20–23.
- HENNING, G.A. & HENNING, S.F. 1996b. A review of the *Hyalites* (Auracraea) *anacreon* species complex in southern Africa with descriptions of two new species and two new subspecies. *Metamorphosis 7,2*: 71–80.
- HENNING, G.A. & HENNING, S.F. 1996c. A review of the genus *Dingana* Van Son (Lepidoptera: Nymphalidae: Satyrinae) with descriptions of a new genus, three new species and three new subspecies. *Metamorphosis 7,4*: 153–172.
- HENNING, G.A. & HENNING, S.F. 1997a. Notes on the genus *Platylesches* Holland (Lepidoptera: Hesperidae) with a description of a new species from South Africa. *Metamorphosis 8,2*: 76–81.

- HENNING, G.A. & HENNING, S.F. 1997b. Revisional notes on the African Satyrinae (Lepidoptera: Nymphalidae) with a description of a new genus. *Metamorphosis* 8,3: 135–140.
- HENNING, G.A. & HENNING, S.F. 2001. Review of the genus *Erikssonia* Trimen (Lepidoptera: Lycaenidae: Theclinae) with a description of a new species. *Metamorphosis* 12,2: 69–78.
- HENNING, G.A. & HENNING, S.F. 2004. A review of the liptenid *Teriomima* Kirby genus group (Lepidoptera: Lycaenidae: Poritiinae) with descriptions of a new genus, a new subgenus, ten new species and four new subspecies. *Metamorphosis* 15,1: 1–61.
- HENNING, G.A., HENNING, S.F., JOANNOU, J. & WOODHALL, S.E. 1997. *Living butterflies of southern Africa, Vol. 1: Hesperidae, Pieridae, Papilionidae of South Africa*. Umदाus Press, Hatfield, Pretoria.
- HENNING, G.A. & ROOS, P.S. 1999. *The conservation status of the Heidelberg Copper butterfly*. Report to Gauteng Nature Conservation.
- HENNING, G.A. & ROOS, P.S. 2000a. *Report into threats to the Heidelberg Copper butterfly (Chrysoritis aureus)*. Report to Gauteng Nature Conservation/Gibb Africa.
- HENNING, G.A. & ROOS, P.S. 2000b. *The biology of the Heidelberg Copper butterfly*. Report to Gauteng Nature Conservation.
- HENNING, G.A. & ROOS, P.S. 2001. Threatened butterflies of South African wetlands. *Metamorphosis* 12,1: 26–33.
- HENNING, S.F. 1979. *Chemical communication between lycaenid larvae (Lepidoptera: Lycaenidae) and ants (Hymenoptera: Formicidae)*. Abstract, Zoological Society of Southern Africa: Symposium on Animal Communication: 25.
- HENNING, S.F. 1980. *Chemical communication between lycaenid larvae (Lepidoptera: Lycaenidae) and ants (Hymenoptera: Formicidae)*. Unpublished M.Sc. dissertation. University of the Witwatersrand, Johannesburg.
- HENNING, S.F. 1983a. Biological groups within the Lycaenidae (Lepidoptera). *Journal of the Entomological Society of Southern Africa* 46,1: 65–85.
- HENNING, S.F. 1983b. Chemical communication between lycaenid larvae (Lepidoptera: Lycaenidae) and ants (Hymenoptera: Formicidae). *Journal of the Entomological Society of Southern Africa* 46,1: 341–366.
- HENNING, S.F. 1983c. Studying myrmecophilous Lycaenidae. *Metamorphosis* 1,3: 3.
- HENNING, S.F. 1984a. The effect of ant association on lycaenid larval duration (Lepidoptera: Lycaenidae). *Entomologist's Record and Journal of Variation* 96: 99–102.
- HENNING, S.F. 1984b. Myrmecophilous lycaenid butterflies (Lepidoptera: Lycaenidae) in southern Africa. *Proceedings of the Zoological Society of Southern Africa: Silver Jubilee Symposium*: 8.
- HENNING, S.F. 1984c. Life history and behaviour of the rare myrmecophilous lycaenid *Erikssonia acraeina* Trimen (Lepidoptera: Lycaenidae). *Journal of the Entomological Society of Southern Africa* 47,2: 337–342.
- HENNING, S.F. 1987a. Myrmecophilous Lycaenidae (or how ants help butterflies). *South African Journal of Science* 83: 8, 9.
- HENNING, S.F. 1987b. Myrmecophily in lycaenid butterflies (Lepidoptera: Lycaenidae). *Entomologist's Record and Journal of Variation* 99: 215–222, 261–267.
- HENNING, S.F. 1987c. Outline of Lepidoptera conservation with special reference to ant-associated Lycaenidae. In Lepidopterists' Society of Southern Africa, *Proceedings of the First Lepidoptera Conservation Symposium held at Roodepoort, South Africa on the 8th August 1987*: 5–7. Lepidopterists' Society of Southern Africa, Florida, Johannesburg.
- HENNING, S.F. 1988a. *The Charaxinae of Africa*. Aloe Books, Johannesburg.
- HENNING, S.F. 1988b. Communication in ants (Hymenoptera: Formicidae). *Entomologist's Record and Journal of Variation* 100: 109–114.
- HENNING, S.F. 1994. Butterflies of Kloofendal Nature Reserve. *Metamorphosis* 5,4: 149–152.
- HENNING, S.F. 1997. Chemical communication between lycaenid larvae (Lepidoptera: Lycaenidae) and ants (Hymenoptera: Formicidae). *Metamorphosis, Occasional Supplement* 3: 66–81.
- HENNING, S.[F.] & HENNING, G.[A.] 1984. Life history and behaviour of *Erikssonia acraeina* Trimen (Lepidoptera: Lycaenidae). *Metamorphosis* 1,5: 1–4.
- HENNING, S.F. & HENNING, G.A. 1985. South Africa's endangered butterflies. *Quagga* 10: 16, 17.
- HENNING, S.F. & HENNING, G.A. 1989. *South African Red Data Book—butterflies*. Foundation for Research Development, South African National Scientific Programmes Report No. 158. Council for Scientific and Industrial Research, Pretoria.
- HENNING, S.F. & HENNING, G.A. 1994. A new species of *Aloides* Hübner (Lepidoptera: Lycaenidae) from the Transvaal. In E.L. Pringle, G.A. Henning & J.B. Ball (eds), *Pennington's Butterflies of southern Africa*, edn 2: 200, 201. Struik-Winchester, Cape Town.
- HENNING, S.F. & HENNING, G.A. 1996a. Butterfly conservation in South Africa. *Endangered Wildlife* 24: 10–13.
- HENNING, S.F. & HENNING, G.A. 1996b. A review of the genus *Axiocerses* Hübner (Lepidoptera: Lycaenidae), with descriptions of nine new species and three new subspecies. *Metamorphosis, Occasional Supplement* 1: 1–48.
- HENNING, S.F. & HENNING, G.A. 1996c. Notes on the *Acraea* (*Acraea*) *rabbaiiae* species group of the Acraeinae (Lepidoptera: Nymphalidae). *Metamorphosis* 7,2: 65–67.

- HENNING, S.F. & HENNING, G.A. 1996d. A review of the *Stygionympha robertsoni* species group (Nymphalidae: Satyrinae) with descriptions of a new species and two new subspecies. *Metamorphosis* 7,4: 173–182.
- HENNING, S.F. & HENNING, G.A. 1997. A description of a new species of *Thestor* Hübner (Lepidoptera: Lycaenidae) from the Western Cape Province, South Africa. *Metamorphosis* 8,2: 85–90.
- HENNING, S.F., HENNING, G.A. & SAMWAYS, M.J. 1993a. *Aloeides dentatis dentatis* (Swierstra), *Aloeides dentatis maseruna* (Riley); subfamily Theclinae, tribe Aphnaeini. In T.R. New (ed.), *Conservation biology of Lycaenidae (butterflies)*. Occasional Paper of the IUCN Species Survival Commission No. 8: 154, 155. IUCN, Gland, Switzerland.
- HENNING, S.F., HENNING, G.A. & SAMWAYS, M.J. 1993b. *Eriksonia acraeina* Trimen; subfamily Theclinae, tribe Aphnaeini. In T.R. New (ed.), *Conservation biology of Lycaenidae (butterflies)*. Occasional Paper of the IUCN Species Survival Commission No. 8: 156, 157. IUCN, Gland, Switzerland.
- HENNING, S.F., HENNING, G.A. & SAMWAYS, M.J. 1993c. *Alaena margaritacea* Eltringham; subfamily Lipteninae, tribe Pentilini. In T.R. New (ed.), *Conservation biology of Lycaenidae (butterflies)*. Occasional Paper of the IUCN Species Survival Commission No. 8: 158. IUCN, Gland, Switzerland.
- HENNING, S.F., HENNING, G.A. & SAMWAYS, M.J. 1993d. *Orachrysops (Lepidochrysops) ariadne* (Butler); subfamily Polyommatae, tribe Polyommataini. In T.R. New (ed.), *Conservation biology of Lycaenidae (butterflies)*. Occasional Paper of the IUCN Species Survival Commission No. 8: 159. IUCN, Gland, Switzerland.
- HENNING, W.H. 1977. New species of *Poecilmitis* Butler (Lepidoptera: Lycaenidae) from Namaqualand, Cape, South Africa. *Entomologist's Record* 89: 25–30.
- HEPPNER, J.B. 1991. Faunal regions and the diversity of Lepidoptera. *Tropical Lepidoptera* 2 (Supplement 1): 1–85.
- HEPPNER, J.B. 2004a. Butterflies (Lepidoptera: Rhopalocera). In J.L. Capinera (ed.), *Encyclopedia of Entomology*, Vol. 1, A–E: 384–387. Kluwer, Dordrecht, The Netherlands.
- HEPPNER, J.B. 2004b. Butterflies and moths (Lepidoptera). In J.L. Capinera (ed.), *Encyclopedia of Entomology*. Vol. 1, A–E: 387–428. Kluwer, Dordrecht, The Netherlands.
- HIGGINS, L.G. & RILEY, N.D. 1973. *A field guide to the butterflies of Britain and Europe*: 1–381. Collins, London.
- HILTON-TAYLOR, C. 1996. Red Data List of southern African plants. *Strelitzia* 4: 1–117. National Botanical Institute, Cape Town.
- HOLT, B. 1955. Old forts of the Transkei. *Africana Notes and News* 11,6: 197–200.
- HONEY, M.R. 1993. *Cacyreus marshalli*, a recent addition to the European fauna and details of its spread. *Butterfly Conservation News* 53: 18, 19.
- HUMAN, K.G. & GORDON, D.M. 1997. Effects of Argentine ants on invertebrate biodiversity in northern California. *Conservation Biology* 11: 1242–1248.
- HUNTER, M.L. Jnr. 1996. *Fundamentals of conservation biology*. Blackwell Science, Massachusetts.
- IUCN 2001. *IUCN Red List Categories and Criteria: Version 3.1*. IUCN Species Survival Commission. IUCN, Gland, Switzerland, and Cambridge, UK.
- IUCN 2002. *IUCN Red List*. Information Officer, World Conservation Monitoring Centre, 219 Huntingdon Road, Cambridge CB3 0DL, United Kingdom. Tel: +44 1223 277314; Fax: +44 1223 277136; E-mail: info@wcmc.org.uk
- JACKSON, T.H.E. 1937. The early stages of some African Lycaenidae (Lepidoptera) with an account of the larval habits. *Transactions of the Royal Entomological Society of London* 86: 201–238.
- JERVIS, M.A. & BOGGS, C.L. 2005. Linking nectar amino acids to fitness in female butterflies. *Trends in Ecology and Evolution* 20,11: 585, 586.
- JOANNOU, J.G., STAUDE, H.S. & WOODHALL, S.E. 1995. An annotated list of Lepidoptera collected at Mariepskop, South Africa. *Metamorphosis* 6,2: 57–66.
- JOHNSON, S. 1999. Pollination by Lepidoptera in the flora of southern Africa. *Proceedings of the 2nd International Lepidopterists' Conference of Africa. Lepidoptera: Ambassadors of Biodiversity*, 4–6 November 1999: 17. Cape Town.
- KELLER WALTER, C.F., AMODIO CAMILLO, R. & STÄNZ, S. 1997. A preliminary and annotated list of Lepidoptera—butterflies (Papilionoidea) and moths (Hesperiidae, Sphingidae, Saturniidae)—recorded from the Kingdom of Lesotho, southern Africa. *Metamorphosis* 8,3: 109–130.
- KIELLAND, J. 1990. *Butterflies of Tanzania*. Hill House, Melbourne.
- KLOPPERS, J. & VAN SON, G. 1978. *Butterflies of the Kruger National Park*. National Parks Board of Trustees, Pretoria.
- KOEKEMOER, M. 2002. *Systematics of the Metalasia group in the Relhaniinae*. Unpublished Ph.D. thesis, Rand Afrikaans University, Johannesburg.
- KOOIJ, M.S. & BREDEKAMP, G.J. 1987. 'n Fitososiologiese ondersoek na die plantegroei van Ruimsigskoenlapperreservaat, die voorkeur habitat van *Aloeides dentatis dentatis*. B.Sc. Honours project, University of Potchefstroom for Higher Christian Education, Potchefstroom.
- KROON, D.M. 1999. *Lepidoptera of southern Africa. Host-plants and other associations. A catalogue*: i–xi, 1–160. Lepidopterists' Society of Africa, Sasolburg.

- KRUG, C.B. 2004. The Renosterveld Restoration Project: understanding and restoring West Coast renosterveld. *Veld & Flora* 90,2: 68–70.
- KUDRNA, O. 1995. Conservation of butterflies in central Europe. In A.S. Pullin (ed.), *Ecology and conservation of butterflies*: 248–257. Chapman & Hall, London.
- LAMBORN, W.A. 1914. On the relationship between certain West African insects, especially ants, Lycaenidae and Homoptera. *Transactions of the Entomological Society of London* 1913: 436–498.
- LARSEN, T.B. 1995. Butterfly biodiversity and conservation in the Afrotropical region. In A.S. Pullin (ed.), *Ecology and conservation of butterflies*: 290–303. Chapman & Hall, London.
- LARSEN, T.B. 1996. *The butterflies of Kenya and their natural history*. Oxford University Press, Oxford.
- LARSEN, T.B. 2005. *Butterflies of West Africa*. Text Volume. Apollo Books, Stenstrup.
- LAWRENCE, J.M. 2000. Butterflies of the East Rand, South Africa. *Metamorphosis* 10,4: 183–185.
- LAWRENCE, J.M., BROWN, M., LAWRENCE, P.D. & BALLANTYNE, C.J. 1998. Butterflies of the Pietermaritzburg National Botanic Gardens, South Africa: a conservation perspective. *Metamorphosis* 9,4: 149–155.
- LAWRENCE, J.M., LAWRENCE, P.D. & LAWRENCE, D.R. 1999. A note on the Red Listed *Metisella meninx* skipper (Lepidoptera: Hesperidae). *Metamorphosis* 10,2: 84, 85.
- LEES, D.C. & MINET, J. 2003. Lepidoptera: Systematics and diversity. In S.M. Goodman & J.P. Benstead (eds), *The natural history of Madagascar*: 748–761. University of Chicago Press.
- LEWIS, H.L. 1973. *Butterflies of the world*. Follett, Chicago.
- LIBERT, M. 1996a. Contribution à l'étude des Lycaenidae africains révision du genre *Lachnocnema* Trimen, (Lepidoptera: Lycaenidae). Première partie. *Lambillionea* 96: 185–202.
- LIBERT, M. 1996b. Contribution à l'étude des Lycaenidae africains révision du genre *Lachnocnema* Trimen, (Lepidoptera: Lycaenidae). Deuxième partie. *Lambillionea* 96: 367–386.
- LIBERT, M. 1996c. Contribution à l'étude des Lycaenidae africains révision du genre *Lachnocnema* Trimen, (Lepidoptera: Lycaenidae). Troisième partie. *Lambillionea* 96: 479–500.
- LOW, A.B. & REBELO, A.G. (eds) 1998. *Vegetation of South Africa, Lesotho and Swaziland*, edn 2. Department of Environmental Affairs and Tourism, Pretoria.
- LU, S-S. & SAMWAYS, M.J. 2001. Life history of the threatened Karkloof blue butterfly, *Orachrysops ariadne* (Lepidoptera: Lycaenidae). *African Entomology* 9,2: 137–151.
- LU, S-S. & SAMWAYS, M.J. 2002a. Behavioural ecology of the Karkloof blue butterfly, *Orachrysops ariadne* (Lepidoptera: Lycaenidae) relevant to its conservation. *African Entomology* 10,1: 137–147.
- LU, S-S. & SAMWAYS, M.J. 2002b. Conservation management recommendations for the Karkloof blue butterfly, *Orachrysops ariadne* (Lepidoptera: Lycaenidae). *African Entomology* 10,1: 149–159.
- LUBKE, R.A., HOARE, D., VICTOR, J. & KETELAAR, R. 2003. The vegetation of the habitat of the Brenton blue butterfly, *Orachrysops niobe* (Trimen), in the Western Cape, South Africa. *South African Journal of Science* 99,5,6: 201–206.
- LUNDERSTEDT, M. 1990. Checklist of butterflies of the Goldfields area in the Orange Free State. *Metamorphosis* 1,27: 22, 23.
- MARAVALHAS, E. (ed.) 2003. *As Borbletas de Portugal*. Apollo Books, Denmark.
- MATTHEWS, W.S., VAN WYK, A.E. & BREDEKAMP, G.J. 1993. Endemic flora of the north-eastern Transvaal Escarpment. *Biological Conservation* 63: 83–94.
- MIGDOLL, I. 1987. *A field guide to the butterflies of southern Africa*. Struik, Cape Town.
- MILTON, S.J., YEATON, R.I., DEAN, W.R.J. & VLOK, J.H.J. 1997. Succulent karoo. In R.M. Cowling, D.M. Richardson & S.M. Pierce (eds), *Vegetation of southern Africa*: 131–166. Cambridge University Press, Cambridge.
- MORRIS, M.G. 1991. The management of reserves and protected areas. In E. Duffey & A.S. Watt (eds), *The scientific management of animal and plant communities for conservation*: 527–552. Symposium 11 of the British Ecological Society. Blackwell, Oxford.
- MORRIS, M.G. & THOMAS, J.A. 1989. Re-establishment of insect populations. *Moths and Butterflies of Great Britain and Ireland*, Vol. 7: 22–36. Harley Books, Colchester.
- MORRIS, M.G., THOMAS, J.A., WARD, L.K., SNAZELL, R.G., PYWELL, R.F., STEVENSON, M.J. & WEBB, N.R. 1994. Re-creation of early-successional stages for threatened butterflies: an ecological engineering approach. *Journal of Environmental Management* 42: 119–135.
- MUCINA, L. & RUTHERFORD, M.C. (eds) 2005. *Vegetation Map of South Africa, Lesotho and Swaziland: shapefiles of basic mapping units*. Beta version 4.0, February 2004. National Botanical Institute, Cape Town.
- MUCINA, L., RUTHERFORD, M.C. & POWRIE, L.W. (eds) 2005. *Vegetation Map of South Africa, Lesotho and Swaziland*, 1:1 000 000 scale sheet maps. South African National Biodiversity Institute, Pretoria.
- MUCINA, L. & RUTHERFORD, M.C. (eds) 2006. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.

- MUNGUIRA, M.L. 1995. Conservation of butterfly habitats and diversity in European Mediterranean countries. In A.S. Pullin (ed.), *Ecology and conservation of butterflies: 277–289*. Chapman & Hall, London.
- MUNGUIRA, M.L. & THOMAS, J.A. 1992. Use of road verges by butterfly and burnet populations, and the effect of roads on adult dispersal and mortality. *Journal of Applied Ecology* 20: 59–83.
- MURRAY, D.P. 1935. *South African butterflies: a monograph of the family Lycaenidae*. John Bale Sons & Danielsson Ltd., London.
- NEW, T.R. 1993. Introduction to the biology and conservation of the Lycaenidae. In T.R. New (ed.), *Conservation biology of Lycaenidae (butterflies)*. Occasional Paper of the IUCN Species Survival Commission No. 8: 1–21. Gland, Switzerland.
- NEW, T.R. 1995. Butterfly conservation in Australasia—an emerging awareness and an increasing need. In A.S. Pullin (ed.), *Ecology and conservation of butterflies: 304–315*. Chapman & Hall, London.
- NEW, T.R. 1997. *Butterfly conservation*, edn 2. Oxford University Press, Melbourne.
- NEW, T.R., VAN PRAAGH, B.D. & YEN, A.L. 1999. Fire and the management of habitat quality in an Australian lycaenid butterfly, *Paralucia pyrodiscus lucida* Crosby, the Eltham Copper. *Proceedings of the 2nd International Lepidopterist Conference of Africa*: 30.
- NEWTON, I.P. & KNIGHT, R. 2004. The matrix: the evolutionary development of coastal renosterveld. *Veld & Flora* 90,4: 162–165.
- OATES, M.R. 1995. Butterfly conservation within the management of grassland habitats. In A.S. Pullin (ed.), *Ecology and conservation of butterflies: 98–112*. Chapman & Hall, London.
- OATES, M.R. & WARREN, M.S. 1990. A review of butterfly introduction in Britain and Ireland. World Wide Fund for Nature (WWF-UK), Godalming.
- ODENDAAL, F.J. 1993. A preliminary report on the feasibility and effectiveness of the Ruimsig Entomological Reserve in protecting the butterfly species *Aloeides dentatis*: the role of active management in manipulating population size. For South African Nature Foundation (later to become WWF, South Africa) and Roodepoort City Council, 1989–1993.
- OPLER, P.A. 1995. Conservation and management of butterfly diversity in North America. In A.S. Pullin (ed.), *Ecology and conservation of butterflies: 316–324*. Chapman & Hall, London.
- OWEN-JOHNSTON, N.K. 1991. Thoughts and observations on the genus *Poecilmitis* Butler (Lepidoptera: Lycaenidae) in the Transvaal. *Metamorphosis* 2,3: 49, 50.
- PARSONS, M. 1999. *The butterflies of Papua New Guinea: their systematics and biology: 1–736*. Academic Press, London.
- PEÑA, C., WAHLBERG, N., WEINGARTNER, E., KODANDARAMAIAH, U., NYLIN, S., FREITAS, A.V.L. & BROWER, A.V.Z. 2006. Higher level phylogeny of Satyrinae butterflies (Lepidoptera: Nymphalidae) based on DNA sequence data. *Molecular Phylogenetics and Evolution* 40,1: 29–49.
- PENNINGTON, K.M. 1946. Note on early stages and distribution of some rare South African butterflies. *Journal of the Entomological Society of Southern Africa* 3: 128–130.
- PENNINGTON, K.M. 1951. Description of female of *Lepidochrysops swanepoeli* Penn. (Lepidoptera: Rhopalocera) and variation in male. *Journal of the Entomological Society of Southern Africa* 14: 148, 149.
- PIERRE, J. & BERNAUD, D. 1999. *Acraea serena* (Fabricius 1775) (= *A. eponina* Cramer, 1780), problème de nomenclature et premiers états (Lepidoptera, Nymphalidae) *Bulletin de la Société française d'Entomologie* 104: 357–364.
- PINHEY, E.C.G. 1949. Butterflies of Rhodesia. *Look Around You Series* No. 2. Rhodesia Scientific Association, Salisbury.
- PINHEY, E.C.G. 1965. *Butterflies of southern Africa*. Nelson & Sons, Johannesburg.
- POOL, R. & HASELAU, W. 1986. Paapekuil Outspan: Portion 6 No. 1, Crown Grant 127, Registered 16 September 1941. *Memorandum to the Secretary, Divisional Council of the Cape, P.O. Box 1073, Cape Town*. 8000. 14 October 1986.
- PRIMACK, R.B. 2002. *Essentials of conservation biology*, edn 3. Sinauer Associates, Inc. Publishers, Sunderland, Massachusetts.
- PRINGLE, E.L. 1994. Four new Lycaenidae from the Cape Province, South Africa. *Metamorphosis* 5,3: 107–114.
- PRINGLE, E.L. 1995. A new subspecies of *Charaxes xiphares* (Cramer) (Lepidoptera: Nymphalidae) from the Western Cape Province, South Africa. *Metamorphosis* 6,4: 176–179.
- PRINGLE, E.L. 1998. Another new *Neptis* for South Africa. *Metamorphosis* 9,2: 92.
- PRINGLE, E.L. 2002. New butterfly reserve at Coega, Eastern Cape Province, South Africa. *Metamorphosis* 13,3: 90, 91.
- PRINGLE, E.L., HENNING, G.A. & BALL, J.B. (eds) 1994. *Pennington's Butterflies of southern Africa*, edn 2. Struik Winchester, Cape Town.
- PRINGLE, E.L. & KYLE, R.G. 2002. Checklists of the butterflies of the Ndumo, Tembe and Kosi Bay Nature Reserves, KwaZulu-Natal, South Africa. *Metamorphosis* 13,1: 18–27.
- PRINGLE, E.L. & SCHLOSZ, M.J. 1997. Description of a new race of *Kedestes niveostriga* (Trimen) (Lepidoptera: Hesperiiidae) from the Greyton district of the south-western Cape. *Metamorphosis* 8,4: 167–171.

- PRYKE, S.R. & SAMWAYS, M.J. 2003. Quality of remnant indigenous grassland linkages for adult butterflies (Lepidoptera) in an afforested African landscape. *Biodiversity and Conservation* 12: 1985–2004.
- PULLIN, A.S., MCLEAN, I.F.G. & WEBB, M.R. 1995. Ecology and conservation of *Lycaena dispar*: British and European perspectives. In A.S. Pullin (ed.), *Ecology and conservation of butterflies*: 150–164. Chapman & Hall, London.
- PYLE, R.M., BENTZIEN, M.M. & OPLER, P.A. 1981. Insect conservation. *Annual Reviews of Entomology* 26: 233–258.
- REBELO, A.G. 1995. *Sasol proteas: a field guide to the proteas of southern Africa*. Fernwood Press in association with the National Botanical Institute, Vlaeberg.
- REBELO, A.G., BOUCHER, C., HELME, N., MUCINA, L. & RUTHERFORD, M.C. 2006. Fynbos Biome. In L. Mucina & M.C. Rutherford (eds), *The vegetation of South Africa, Lesotho and Swaziland. Strelitzia* 19: 53–219. South African National Biodiversity Institute, Pretoria.
- RICHARDSON, I. 2005. Rewards to a few. *Cape Times* 31 October 2005: 10.
- RICHARDSON, I.K.B. 1978. Endemic taxa and the taxonomist. In H.E. Street (ed.), *Essays in plant taxonomy*: 245–262. Academic Press, London.
- RILEY, N.D. 1954. A new species of *Thestor* (Lepidoptera: Lycaenidae) from South Africa. *Entomologist* 87: 97–102.
- ROOS, P. & HENNING, G.A. 2000. The Heidelberg Copper butterfly. *African Wildlife* 54,2: 24–27.
- ROUGET, M., REYERS, B., JONAS, Z., DRIVER, A., DESMET, P., MAZE, K., EGOH, B., COWLING, R.M., RUTHERFORD, M. & MUCINA, L. 2004. *South African National Biodiversity Assessment 2004: Technical Report. Volume 1: Terrestrial Component*. South African National Biodiversity Institute, Pretoria.
- ROURKE, J.P. 1980. *The proteas of southern Africa*. Purnell, Cape Town.
- SACCHERI, I.J., BOGGS, C.L., HANSKI, I. & EHRlich, P.R. 2004. Genetics of Checkerspot populations. In P.R. Ehrlich & I. Hanski (eds), *On the wings of Checkerspots: a modal system for population biology*: 199–218. Oxford University Press, Oxford.
- SALMON, M.A. 2000. *The Aurelian legacy: British butterflies and their collectors*: 1–432. Harley Books, Colchester, Essex.
- SAMWAYS, M.J. 1993. Threatened Lycaenidae of South Africa. In T.R. New (ed.), *Conservation biology of Lycaenidae (butterflies)*. Occasional Paper of the IUCN Species Survival Commission No. 8: 62–69. Gland, Switzerland.
- SAMWAYS, M.J. 1994. *Insect conservation biology*. Chapman & Hall, London.
- SAMWAYS, M.J. 1999. Translocating fauna to foreign lands: here comes the Homogenocene. *Journal of Insect Conservation* 3: 65, 66 (editorial).
- SAMWAYS, M.J. 2005. *Insect diversity conservation*. Cambridge University Press, Cambridge.
- SAMWAYS, M.J., CALDWELL, P.M. & OSBORN, R. 1996. Ground-living invertebrate assemblages in native, planted and invasive vegetation in South Africa. *Agriculture, Ecosystems and Environment* 59: 19–32.
- SCHLOSZ, M. & BRINKMAN, A.K. 1991. The life history of *Tylopaedia sardonyx peringueyi* (Aurivillius). *Journal of the Entomological Society of South Africa* 54: 81–89.
- SCOTT, J.A. 1997. *The butterflies of North America: a natural history and field guide*: 1–583. Stanford University Press, Stanford, California.
- SCOTT-SHAW, R. 1999. *Rare and threatened plants of KwaZulu-Natal and neighbouring regions*. KwaZulu-Natal Nature Conservation Service, Pietermaritzburg.
- SCUDDER, S.H. 1889. The fossil butterflies of Florissant. *United States Geological Survey, Annual Report* 8: 439–474.
- SCUDDER, S.H. 1892. Some insects of special interest from Florissant, Colorado and other points in the Tertiaries of Colorado and Utah. *United States Geological Survey Bulletin* 93: 1–25.
- SILVA-BRANDÃO, K.L., WAHLBERG, N., FRANCINI, R.B., AZEREDO-ESPIN, A.M.L., BROWN, K.S., PULUCH, M., LEES, D.C. & FREITAS, A.V.L. 2008. Phylogenetic relationships of butterflies of the tribe Acraeini (Lepidoptera, Nymphalidae, Heliconiinae) and the evolution of plant use. *Molecular Phylogenetics and Evolution* 46: 515–531.
- SLINGSBY, P. & ROBERTSON, H. (eds) 1991. *Ants of the Western Cape. Environmental Resource Guide No. 1*. Published jointly by Ekko, Kleinmond, Botanical Society of South Africa, Kirstenbosch, and the National Botanical Institute, Claremont.
- SPEIGHT, M.R., HUNTER, M.D. & WATT, A.D. 1999. *Ecology of insects: concepts and applications*. Blackwell Science, Oxford.
- STEELE, B. 1991. Survey of butterflies, Port St. Johns, April 1991. *Metamorphosis* 2,3: 13–16.
- STEENKAMP, C. & STEIN, R. 1999. *The Brenton blue saga: a case study of South African biodiversity conservation*. Endangered Wildlife Trust, in association with Nedbank and the Danish Cooperation for Environment and Development, Parkview.
- SWANEPOEL, D.A. 1953. *Butterflies of South Africa: where, when and how they fly*. Maskew Miller, Cape Town.
- SWENGEL, A.B. 1998. Effects of management on butterfly abundance in tallgrass prairie and pine barrens. *Biological Conservation* 83: 77–89.
- TERBLANCHE, R.F. 1994. The little hairtail from the Kalahari. *Metamorphosis* 5,4: 173, 174.
- TERBLANCHE, R.F. 2001. The significance of three endemic *Anthene* species (Lepidoptera: Lycaenidae) for the conservation of terrestrial ecosystems associated

- with rivers and a 'sub-surface lake' in South Africa. In T. Olckers & D.J. Brothers (eds), *Proceedings of the 13th Entomological Congress, Entomological Society of Southern Africa*: 65, 66. Pietermaritzburg, 2–5 July 2001. Entomological Society of Southern Africa, Pretoria, South Africa.
- TERBLANCHE, R.F. 2005. Ant assemblages and dominance structures at localities of the myrmecophilous (ant-associated) threatened Heidelberg Copper Butterfly, *Chrysoritis aureus* (Lepidoptera Lycaenidae). In M.H. Villet (ed.), *Proceedings of the 15th Entomological Congress, Entomological Society of Southern Africa*: 80, 81. Grahamstown, 10–13 July 2005. Entomological Society of Southern Africa, Pretoria.
- TERBLANCHE, R.F. & EDGE, D.A. 2007. The first record of an *Orachrysops* in Gauteng. *Metamorphosis* 18,4: 131–141.
- TERBLANCHE, R.F. & HENNING, G.A. 1994. Butterflies of the Lagalameetse Nature Reserve. *Metamorphosis* 5,4: 175–180.
- TERBLANCHE, R.F., MORGENTHAL, T.L. & CILLIERS, S.S. 2003. The vegetation of three localities of the threatened butterfly species *Chrysoritis aureus* (Lepidoptera: Lycaenidae). *Koedoe* 46,1: 73–90.
- TERBLANCHE, R.F. & TAYLOR, J.C. 2000. Notes on the butterflies of Witsand—a unique terrestrial island in the Northern Cape Province, South Africa—with special reference to two Red Data Book butterfly species. *Metamorphosis* 11,3: 122–131.
- TERBLANCHE, R.F. & VAN HAMBURG, H. 2003. The taxonomy, biogeography and conservation of the myrmecophilous *Chrysoritis* butterflies (Lepidoptera: Lycaenidae) in South Africa. *Koedoe* 46,2: 65–81.
- TERBLANCHE, R.F. & VAN HAMBURG, H. 2004. The application of life history information to the conservation management of *Chrysoritis* butterflies (Lepidoptera: Lycaenidae) in South Africa. *Koedoe* 47,1: 55–65.
- THOMAS, C.D. 1995. Ecology and conservation of butterfly metapopulations in the fragmented British landscape. In A.S. Pullin (ed.), *Ecology and conservation of butterflies*: 46–64. Chapman & Hall, London.
- THOMAS, J.A. 1993. Holocene climate changes and warm man-made refugia may explain why six of British butterflies possess unnatural early-successional habitats. *Ecography* 16: 278–284.
- TITE, G.E. & DICKSON, C.G.C. 1968. The *Aloeides thyra* complex (Lepidoptera: Lycaenidae). *Bulletin of the British Museum (Natural History) Entomology* 21,7: 367–388.
- TITE, G.E. & DICKSON, C.G.C. 1973. The genus *Aloeides* and allied genera (Lepidoptera: Lycaenidae). *Bulletin of the British Museum (Natural History) Entomology* 29,5: 225–280.
- TRIMEN, R. & BOWKER, J.H. 1887–1889. *South African butterflies*, Vols. 1–3. Trubner, London.
- VANE-WRIGHT, R.I. 2003. *Butterflies*. The Natural History Museum, London.
- VAN ROOYEN, N. & BREDEKAMP, G.J. 1996. Soutpansberg Arid Mountain Bushveld: Savanna Biome. In A.B. Low & A.G. Rebelo (eds), *Vegetation of South Africa, Lesotho and Swaziland*. Department of Environmental Affairs and Tourism, Pretoria.
- VAN SON, G. 1949. The butterflies of southern Africa. Part I. Papilionidae and Pieridae. *Transvaal Museum Memoir* No. 3. Pretoria.
- VAN SON, G. 1955. The butterflies of southern Africa. Part II. Nymphalidae: Danainae and Satyrinae. *Transvaal Museum Memoir* No. 8. Pretoria.
- VAN SON, G. 1963. The butterflies of southern Africa. Part III. Nymphalidae: Acraeinae. *Transvaal Museum Memoir* No. 14. Pretoria.
- VAN SON, G. 1979. The butterflies of southern Africa. Part IV. Nymphalidae: Nymphalinae. In L. Vári (ed.), *Transvaal Museum Memoir* No. 22. Pretoria.
- VAN WYK, A.E. & SMITH, G.F. 2001. *Regions of floristic endemism in southern Africa. A review with emphasis on succulents*. Umdaus Press, Pretoria.
- VÁRI, L., KROON, D.M. & KRÜGER, M. 2002. *Classification and checklist of the species of Lepidoptera recorded in southern Africa*. Simple Solutions, Chatswood, Australia.
- VLOK, J.H.J., EUSTON-BROWN, D.I.W. & COWLING, R.M. 2003. Acocks's Valley Bushveld 50 years on: new perspectives on the delimitation, characterisation and origin of subtropical thicket vegetation. *South African Journal of Botany* 69,1: 27–51.
- VOGTS, M. 1989. *South Africa's Proteaceae: know them and grow them*, 2nd impression. Struik, Cape Town.
- WARREN, M.S. 1987. The ecology and conservation of the heath fritillary butterfly *Mellicta athalia*. 2. Adult population. *Journal of Applied Ecology* 24: 483–498.
- WARREN, M.S. 1995. Managing local microclimates for the high brown fritillary, *Argynnis adipe*. In A.S. Pullin (ed.), *Ecology and conservation of butterflies*: 198–210. Chapman & Hall, London.
- WARREN, M.S., HILL, J.K., THOMAS, J.A., ASHER, J., FOX, R., HUNTLEY, B., ROY, D.B., TELFER, M.G., JEFFCOATE, G., WILLIS, S.G., GREATORREX-DAVIES, J.N., MOSS, D. & THOMAS, C.D. 2001. Climate versus habitat change: opposing forces underly rapid changes to the distribution and abundances of British butterflies. *Nature* 414: 65–69.
- WILLIAMS, J.G. 1969 (reprinted 1973). *A field guide to the butterflies of Africa*. Collins, London.
- WILLIAMS, M. 2005. Growers pledge to defend the heritage of the winelands. *Cape Argus* 30 November 2005: 10.
- WILLIAMS, M.C. 1993a. Butterflies and moths of Pilanesberg National Park. *Metamorphosis* 4,1: 19–21.

- WILLIAMS, M.C. 1993b. Pilanesberg Lepidoptera survey. *Metamorphosis* 4,3: 118, 119.
- WILLIAMS, M.C. 1994. *Butterflies of southern Africa: a field guide*. Southern Book Publishers, Halfway House.
- WILLIAMS, M.C. 1996. Report on research findings concerning the life history and ecology of the Brenton blue, *Orachrysops niobe* (Trimen) (Lepidoptera: Lycaenidae). *Metamorphosis* 7,1: 3–7.
- WILLIAMS, M.C. 1999. Taxonomic changes affecting the Afrotropical butterflies and skippers (Lepidoptera) since the publication of Carcasson's Butterflies of Africa—Part 1: Lycaenidae. *Metamorphosis* 10,2: 52–69.
- WILLIAMS, M.C. 2007. *Afrotropical butterflies. A digital encyclopaedia* www.atbutterflies.com (accessed January 2009).
- WOODHALL, S.E. 1996. The plight of *Poecilmitis lyncurium* (Trimen, 1868). *Metamorphosis* 7,1: 34–36.
- WOODHALL, S.E. 2005. *Field guide to the butterflies of South Africa*. Struik, Cape Town.

## APPENDIX 1. IUCN Red Data Book Categories

The criteria for threatened categories are: Critically Endangered, Endangered and Vulnerable.

### CRITICALLY ENDANGERED (CR)

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing an extremely high risk of extinction in the wild:

#### A. Reduction in population size based on any of the following:

1. An observed, estimated, inferred or suspected population size reduction of  $\pm 90\%$  over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following:
  - (a) Direct observation.
  - (b) An index of abundance appropriate to the taxon.
  - (c) A decline in area of occupancy, extent of occurrence and/or quality of habitat.
  - (d) Actual or potential levels of exploitation.
  - (e) The effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.
2. An observed, estimated, inferred or suspected population size reduction of  $\pm 80\%$  over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.
3. A population size reduction of 80%, projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.
4. An observed, estimated, inferred, projected or suspected population size reduction of 80% over any 10-year or three-generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

#### B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:

1. Extent of occurrence estimated to be less than 100 km<sup>2</sup>, and estimates indicating at least two of a–c:
  - a. Severely fragmented or known to exist at only a single location.
  - b. Continuing decline, observed, inferred or projected, in any of the following:
    - (i) Extent of occurrence.
    - (ii) Area of occupancy.
    - (iii) Area, extent and/or quality of habitat.
    - (iv) Number of locations or subpopulations.
    - (v) Number of mature individuals.
  - c. Extreme fluctuations in any of the following:
    - (i) Extent of occurrence.
    - (ii) Area of occupancy.
    - (iii) Number of locations or subpopulations.
    - (iv) Number of mature individuals.
2. Area of occupancy estimated to be less than 10 km<sup>2</sup>, and estimates indicating at least two of a–c:
  - a. Severely fragmented or known to exist at only a single location.
  - b. Continuing decline, observed, inferred or projected, in any of the following:
    - (i) Extent of occurrence.
    - (ii) Area of occupancy.
    - (iii) Area, extent and/or quality of habitat.
    - (iv) Number of locations or subpopulations.
    - (v) Number of mature individuals.
  - c. Extreme fluctuations in any of the following:
    - (i) Extent of occurrence.
    - (ii) Area of occupancy.
    - (iii) Number of locations or subpopulations.
    - (iv) Number of mature individuals.

C. Population size estimated to number less than 250 mature individuals and either:

1. An estimated continuing decline of at least 25% within three years or one generation, whichever is longer (up to a maximum of 100 years in the future).  
OR
2. A continuing decline, observed, projected or inferred, in numbers of mature individuals AND at least one of the following (a–b):
  - a. Population structure in the form of one of the following:
    - (i) No subpopulation estimated to contain more than 50 mature individuals.  
OR
    - (ii) At least 90% of mature individuals in one subpopulation.
  - b. Extreme fluctuations in number of mature individuals.

D. Population size estimated to number less than 50 mature individuals.

E. Quantitative analysis showing that the probability of extinction in the wild is at least 50% within 10 years or three generations, whichever is the longer (up to a maximum of 100 years).

**ENDANGERED (EN)**

A taxon is Endangered when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing a very high risk of extinction in the wild:

A. Reduction in population size based on any of the following:

1. An observed, estimated, inferred or suspected population size reduction of 70% over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following:
  - (a) Direct observation.
  - (b) An index of abundance appropriate to the taxon.
  - (c) A decline in area of occupancy, extent of occurrence and/or quality of habitat.
  - (d) Actual or potential levels of exploitation.
  - (e) The effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.
2. An observed, estimated, inferred or suspected population size reduction of 50% over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.
3. A population size reduction of 50%, projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.
4. An observed, estimated, inferred, projected or suspected population size reduction of 50% over any 10-year or three-generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:

1. Extent of occurrence estimated to be less than 5 000 km<sup>2</sup>, and estimates indicating at least two of a–c:
  - a. Severely fragmented or known to exist at no more than five locations.
  - b. Continuing decline, observed, inferred or projected, in any of the following:
    - (i) Extent of occurrence.
    - (ii) Area of occupancy.
    - (iii) Area, extent and/or quality of habitat.
    - (iv) Number of locations or subpopulations.
    - (v) Number of mature individuals.
  - c. Extreme fluctuations in any of the following:
    - (i) Extent of occurrence
    - (ii) Area of occupancy
    - (iii) Number of locations or subpopulations
    - (iv) Number of mature individuals.
2. Area of occupancy estimated to be less than 500 km<sup>2</sup>, and estimates indicating at least two of a–c:
  - a. Severely fragmented or known to exist at no more than five locations.

- b. Continuing decline, observed, inferred or projected, in any of the following:
  - (i) Extent of occurrence.
  - (ii) Area of occupancy.
  - (iii) Area, extent and/or quality of habitat.
  - (iv) Number of locations or subpopulations.
  - (v) Number of mature individuals.
- c. Extreme fluctuations in any of the following:
  - (i) Extent of occurrence.
  - (ii) Area of occupancy.
  - (iii) Number of locations or subpopulations.
  - (iv) Number of mature individuals.

C. Population size estimated to number less than 2 500 mature individuals and either:

1. An estimated continuing decline of at least 20% within five years or two generations, whichever is longer (up to a maximum of 100 years in the future).  
OR
2. A continuing decline, observed, projected or inferred, in numbers of mature individuals AND at least one of the following (a–b):
  - a. Population structure in the form of one of the following:
    - (i) No subpopulation estimated to contain more than 250 mature individuals.  
OR
    - (ii) At least 95% of mature individuals in one subpopulation.
  - b. Extreme fluctuations in number of mature individuals.

D. Population size estimated to number less than 250 mature individuals.

E. Quantitative analysis showing that the probability of extinction in the wild is at least 20% within 20 years or five generations, whichever is the longer (up to a maximum of 100 years).

#### VULNERABLE (VU)

A taxon is Vulnerable when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing a high risk of extinction in the wild:

A. Reduction in population size based on any of the following:

1. An observed, estimated, inferred or suspected population size reduction of 50% over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following:
  - (a) Direct observation.
  - (b) An index of abundance appropriate to the taxon.
  - (c) A decline in area of occupancy, extent of occurrence and/or quality of habitat.
  - (d) Actual or potential levels of exploitation.
  - (e) The effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.
2. An observed, estimated, inferred or suspected population size reduction of 30% over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.
3. A population size reduction of 30%, projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.
4. An observed, estimated, inferred, projected or suspected population size reduction of 30% over any 10-year or three-generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:

1. Extent of occurrence estimated to be less than 20 000 km<sup>2</sup>, and estimates indicating at least two of a–c:
  - a. Severely fragmented or known to exist at no more than 10 locations.
  - b. Continuing decline, observed, inferred or projected, in any of the following:
    - (i) Extent of occurrence.
    - (ii) Area of occupancy.
    - (iii) Area, extent and/or quality of habitat.

- (iv) Number of locations or subpopulations.
- (v) Number of mature individuals.
- c. Extreme fluctuations in any of the following:
  - (i) Extent of occurrence.
  - (ii) Area of occupancy.
  - (iii) Number of locations or subpopulations.
  - (iv) Number of mature individuals.
- 2. Area of occupancy estimated to be less than 2 000 km<sup>2</sup>, and estimates indicating at least two of a–c:
  - a. Severely fragmented or known to exist at no more than 10 locations.
  - b. Continuing decline, observed, inferred or projected, in any of the following:
    - (i) Extent of occurrence.
    - (ii) Area of occupancy.
    - (iii) Area, extent and/or quality of habitat.
    - (iv) Number of locations or subpopulations.
    - (v) Number of mature individuals.
  - c. Extreme fluctuations in any of the following:
    - (i) Extent of occurrence.
    - (ii) Area of occupancy.
    - (iii) Number of locations or subpopulations.
    - (iv) Number of mature individuals.
- C. Population size estimated to number less than 10 000 mature individuals and either:
  - 1. An estimated continuing decline of at least 10% within 10 years or three generations, whichever is longer (up to a maximum of 100 years in the future).  
OR
  - 2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a–b):
    - a. Population structure in the form of one of the following:
      - (i) No subpopulation estimated to contain more than 1 000 mature individuals.  
OR
      - (ii) All mature individuals are in one subpopulation.
    - b. Extreme fluctuations in number of mature individuals.
- D. Population very small or restricted in the form of either of the following:
  - 1. Population size estimated to number less than 1 000 mature individuals.
  - 2. Population with a very restricted area of occupancy (typically smaller than 20 km<sup>2</sup>) or number of locations (typically five or fewer) such that it is prone to the effects of human activities or stochastic events within a very short time period in an uncertain future, and is thus capable of becoming Critically Endangered or even Extinct in a very short time period.
- E. Quantitative analysis showing that the probability of extinction in the wild is at least 10% within 100 years.

#### Citation of the IUCN Red List categories and criteria

To promote the use of a standard format for citing the Red List Categories and Criteria, the following forms of citation are recommended:

1. The Red List Category may be written out in full or abbreviated as follows (when translated into other languages, the abbreviations should follow the English denominations):
  - THREATENED
    - Extinct, EX
    - Extinct in the Wild, EW
    - Critically Endangered, CR
    - Endangered, EN
    - Vulnerable, VU
  - NOT THREATENED
    - Near Threatened, NT
    - Least Concern, LC
    - Data Deficient, DD
    - Not Evaluated, NE

2. Under Section V (the criteria for Critically Endangered, Endangered and Vulnerable) there is a hierarchical alphanumeric numbering system of criteria and subcriteria. These criteria and subcriteria (all three levels) form an integral part of the Red List assessment and all those that result in the assignment of a threatened category must be specified after the Category.

Under the Criteria A to C and D under Vulnerable, the first level of the hierarchy is indicated by the use of numbers (1–4) and if more than one is met, they are separated by means of the ‘+’ symbol. The second level is indicated by the use of the lower case alphabet characters (a–e). These are listed without any punctuation. A third level of the hierarchy under Criteria B and C involves the use of lower case roman numerals (i–v). These are placed in parentheses (with no space between the preceding alphabet character and start of the parenthesis) and separated by the use of commas if more than one is listed. Where more than one criterion is met, they should be separated by semicolons.

## APPENDIX 2. An annotated checklist of previous Red Data Book species (S.F. Henning & G.A. Henning 1989) that are excluded from the present list

The previous *South African Red Data Book—Butterflies* by S.F. Henning & G.A. Henning (1989) was a report of the committee of the Nature Conservation National Programme for Ecosystem Research issued by the Foundation for Research Development and Council for Scientific and Industrial Research. The following taxa were included in that publication but no longer meet the requirements for a threatened species as per the criteria above. More localities have been found for a number of the taxa listed below.

Taxa that are not threatened (Indeterminate taxa) are not included in this Red Data Book.

The following taxa were listed as Rare or Indeterminate:

### Superfamily Papilionoidea

#### Family Papilionidae

##### Subfamily Papilioninae

*Papilio euphranor* (LC). Widespread in forests on the eastern side of the country. Although it is the only endemic South African swallowtail species, the conservation status of *Papilio euphranor* falls outside any of the threatened categories.

#### Family Pieridae

##### Subfamily Pierinae

*Colotis doubledayi angolanus* (LC). Marginal subspecies with a wide distribution and many remote localities.

*Appias sabina phoebe* (LC). Marginal subspecies. More localities have been found in recent years.

#### Family Nymphalidae

##### Subfamily Heliconiinae

*Acraea machequena* (LC). Marginal species; localities in South Africa often recorded owing to migratory behaviour. The butterfly has a wide distribution.

*Acraea rabbaiae* (LC). Marginal subspecies. Many more localities of this species have been found in northern KwaZulu-Natal in the past two decades.

*Acraea satis* (LC). Marginal species. More localities have been found in recent years.

##### Subfamily Satyrinae

*Dingana alaedeus* (LC). Additional distribution records, of which many are inaccessible habitat, have recently been found.

*Dira jansei* (LC). The distribution of this species is much more extensive than previously believed.

*Dira swanepoeli isolata* (LC). Butterfly occurs in remote habitats that are not threatened.

*Pseudonympha camdeboo* (LC). Butterfly occurs in inaccessible habitat that is under no threat.

*Serradinga* (previously *Dingana*) *bowkeri bella* (LC). Remote habitat; not threatened.

*Torynesis orangica* (LC). Is found in the Golden Gate Highlands National Park as well as mountains that surround Clarens in the northeastern Free State Province.

*Torynesis pringlei* (LC). Mainly in Lesotho; very remote habitat; more research needed.

##### Subfamily Charaxinae

*Charaxes protoclea azota* (LC). A marginal subspecies. More localities of the butterfly have been found in northern KwaZulu-Natal in recent years.

*Charaxes etesipe tavetensis* (LC). A marginal subspecies. More localities, including strong populations such as those in the eastern Soutpansberg, have been found.

*Charaxes pondoensis* (LC). Has a wide distribution and is not threatened.

*Charaxes marieps* (LC). Occurs in a number of forested areas of the Mpumalanga Drakensberg, which are not under threat.

### Subfamily Limenitidinae

*Euriphene achlys* (LC). A marginal species. There are a few localities in South Africa where regular sightings are made.

### Subfamily Cyrestinae

*Cyrestis pantheus sublineatus* (LC). A marginal subspecies. The localities in South Africa are not under threat.

## Family Lycaenidae

### Subfamily Poritiinae

*Ornipholidotos peucetia penningtoni* (LC). More colonies of this species have been found in a number of nature reserves in northern KwaZulu-Natal.

### Subfamily Miletinae

*Thestor dryburghi* (LC). Many widespread subpopulations.

*Thestor strutti* (NT). Remote habitat; a few localities are now known.

*Thestor kaplani* (LC). No immediate threats.

*Thestor dicksoni dicksoni* (LC). Remote habitat.

*Thestor dicksoni calviniae* (LC). Remote habitat.

*Thestor swanepoeli* (LC). Widespread.

*Thestor montanus pictus* (DD). Full range not ascertained; widespread.

*Thestor compassbergae* (LC). Remote habitat.

*Thestor rossouwi* (LC). Many widespread subpopulations.

*Thestor pringlei* (LC). Remote habitat.

*Thestor yildizae* (LC). Many widespread subpopulations.

*Thestor tempe* (LC). A few subpopulations.

*Thestor stepheni* (LC). A few subpopulations.

### Subfamily Theclinae

*Hypolycaena lochmophila* (LC). Marginal species.

*Iolaus lulua* (LC). Found in nature reserves.

*Iolaus aphnaeoides* (LC). Wide distribution.

*Iolaus diametra natalica* (LC). In nature reserves; a marginal subspecies.

*Phasis thero cedarbergae* (LC). Widespread in remote wilderness area.

*Phasis pringlei* (LC). Remote habitat.

*Aloeides kaplani* (LC). Remote habitat.

*Aloeides caledoni* (LC). Occurs over a huge area, but in small numbers.

*Aloeides nollothi* (LC). Widespread in a remote area.

*Aloeides merces* (LC). Additional distribution records and inaccessible habitat.

*Aloeides pringlei* (LC). No threats; in nature reserves.

*Aloeides egerides* (LC). No threats; in nature reserves.

*Chrysoritis oreas* (LC). A number of colonies in nature reserves.

*Chrysoritis cottrelli* (DD). Now known from a few localities; not threatened.

**Note—the following taxa, in the genus *Chrysoritis*, were previously listed under the genus *Poecilmitis*:**

*Chrysoritis pyroeis hersaleki* (LC). Remote habitats.

*Chrysoritis wykehami* (LC). Known from a few populations; remote habitat.

*Chrysoritis brooksi tearei* (LC). Widespread, but in small numbers.

- Chrysoritis pan* (LC). Widespread; has some large subpopulations.
- Chrysoritis orientalis* (LC). In nature reserves; under no threat.
- Chrysoritis irene* (LC). Known from a few localities in rugged terrain.
- Chrysoritis swanepoeli* (LC). Widespread in remote habitat.
- Chrysoritis hyperion* (LC). Remote habitat.
- Chrysoritis henningi* (LC). Not threatened; in remote habitat.
- Chrysoritis lyndseyae* (LC). Not threatened; in remote habitat.
- Chrysoritis kaplani* (LC). Not threatened; in remote habitat.
- Chrysoritis stepheni* (LC). Not threatened; in remote habitat.
- Chrysoritis endymion* (LC). Widespread; in remote habitat.
- Chrysoritis pyramus* (LC). Not threatened; in remote habitat.
- Chrysoritis daphne* (LC). Not threatened; in remote habitat.
- Chrysoritis balli* (LC). Not threatened; in remote habitat.
- Chrysoritis azurius* (LC). Not threatened; in remote habitat.
- Chrysoritis nigricans nigricans* (LC). Is threatened at Pella Mission (WC) and in the Table Mountain National Park but is common on the coast from Vermaaklikheid to Struis Bay.
- Chrysoritis nigricans zwartbergae* (LC). Widespread and common on Great Swartberg.
- Chrysoritis adonis* (LC). Not threatened; in remote habitat.

#### Subfamily Polyommatae

- Anthene minima* (LC). Marginal species.
- Cylyrius babaulti* (LC). Marginal species.
- Tuxentius melaena griqua* (LC). Several additional localities located.
- Lepidochrysops oosthuizeni* (LC). Remote localities.
- Lepidochrysops poseidon* (LC). Inhabits remote localities.
- Lepidochrysops loewensteini* (LC). Inhabits remote localities, mainly Lesotho, with only one record in SA.
- Lepidochrysops victori* (LC). Inhabits remote localities.
- Lepidochrysops badhami* (LC). Not threatened; in remote habitats.
- Lepidochrysops bacchus* (LC). Widespread from Coega to Piketberg and Namaqualand. A few localities in the Swartland have very few specimens.
- Lepidochrysops penningtoni* (DD). Range uncertain. It certainly has not been seen near Steinkopf for many years. People have theories as to whether other golden/dark Namaqualand subpopulations are *L. penningtoni* or not. Remote habitats. Urgent taxonomic research needed.
- Lepidochrysops jamesi jamesi* (LC). Can occur in huge numbers over a wide area. Needs a few good years with rain. Remote habitat.
- Lepidochrysops jamesi claassensi* (LC). Can occur in good numbers after rains; remote habitat.
- Lepidochrysops titei* (LC). Very widespread, often in good numbers.
- Lepidochrysops wykehami* (LC). Widespread; often in numbers.
- Lepidochrysops oreas oreas* (LC). Not threatened; in nature reserves.
- Lepidochrysops quickelbergei* (LC). Not threatened; in remote habitat.
- Lepidochrysops pringlei* (LC). Widespread; in good numbers.
- Lepidochrysops balli*, (LC). Not threatened; in remote habitat.
- Lepidochrysops littoralis* (LC). Widespread; in good numbers.
- Lepidochrysops outeniqua* (LC). Not threatened; in remote habitat.

## Superfamily Hesperioidea

### Family Hesperiidae

#### Subfamily Coeliadinae

*Coeliades anchises* (LC). Marginal subspecies.

*Coeliades libeon* (LC). Marginal species.

#### Subfamily Pyrginae

*Sarangesa ruona* (LC). Marginal species.

*Abantis bicolor* (LC). In nature reserves; wide distribution.

*Spialia confusa confusa* (LC). Marginal subspecies.

*Spialia paula* (LC). Marginal species.

#### Subfamily Heteropterinae

*Metisella syrinx* (LC). Widespread; not in any way threatened.

*Tsitana dicksoni* (LC). Widespread; not threatened.

#### Subfamily Hesperinae

*Andronymus caesar philander* (LC). Marginal subspecies.

*Platylesches tina* (LC). Marginal species.

*Borbo micans* (LC). Marginal species.

*Borbo ferruginea dondo* (LC). Marginal subspecies.

*Gegenes hottentota* (LC). Marginal species.

### APPENDIX 3. The IUCN Red List of 2002 with an indication of retained and excluded taxa

The World Conservation Monitoring Centre provides information services on conservation and sustainable use of the world's living resources. A database search shows that the following South African species were included in the IUCN Red List of Threatened Animals in 2002 (IUCN 2002):

Class: INSECTA  
Order: LEPIDOPTERA  
Family: LYCAENIDAE

<i>Alaena margaritacea</i> VU D2 *	<i>Lepidochrysops wykehami</i> VU D2
<i>Aloeides caledoni</i> VU D2	<i>Orachrysops ariadne</i> VU D2 *
<i>Aloeides carolynnae</i> VU D2 *	<i>Orachrysops niobe</i> EN B1+2c *
<i>Aloeides dentatis</i> VU D2 *	<i>Oxychaeta dicksoni</i> EN B1+2c *
<i>Aloeides egerides</i> VU B1+2c	<i>Phasis pringlei</i> VU D2
<i>Aloeides kaplani</i> VU D2	<i>Poecilmitis adonis</i> VU D2
<i>Aloeides lutescens</i> VU D2 *	<i>Poecilmitis aureus</i> LR/nt *
<i>Aloeides merces</i> VU D2	<i>Poecilmitis azurius</i> VU D2
<i>Aloeides nollothi</i> VU D2	<i>Poecilmitis balli</i> VU D2
<i>Aloeides nubilus</i> VU D2 *	<i>Poecilmitis daphne</i> VU D2
<i>Aloeides pringlei</i> VU D2	<i>Poecilmitis endymion</i> VU D2
<i>Aloeides rossouwi</i> VU D2 *	<i>Poecilmitis henningi</i> VU D2
<i>Aslauga australis</i> VU D2	<i>Poecilmitis hyperion</i> VU D2
<i>Capys penningtoni</i> VU D2 *	<i>Poecilmitis irene</i> VU D2
<i>Chrysoritis cottrelli</i> CR B1+2c	<i>Poecilmitis kaplani</i> VU D2
<i>Chrysoritis oreas</i> LR/nt	<i>Poecilmitis lyncurium</i> VU D2 *
<i>Deloneura immaculata</i> EX *	<i>Poecilmitis lyndseyae</i> VU D2
<i>Erikssonia acraeina</i> VU D2 *	<i>Poecilmitis orientalis</i> VU D2
<i>Iolaus aphnaeoides</i> LR/nt	<i>Poecilmitis pan</i> DD
<i>Iolaus lulua</i> VU D2	<i>Poecilmitis penningtoni</i> VU D2 *
<i>Lepidochrysops bacchus</i> LR/nt	<i>Poecilmitis pyramus</i> VU D2
<i>Lepidochrysops badhami</i> VU D2	<i>Poecilmitis rileyi</i> EN B1+2c *
<i>Lepidochrysops balli</i> VU D2	<i>Poecilmitis stepheni</i> VU D2
<i>Lepidochrysops hypopolia</i> EX *	<i>Poecilmitis swanepoeli</i> EN B1+3d
<i>Lepidochrysops jefferyi</i> VU D2 *	<i>Poecilmitis trimeni</i> VU D2
<i>Lepidochrysops littoralis</i> VU D2	<i>Poecilmitis wykehami</i> VU D2
<i>Lepidochrysops loewensteini</i> VU D2	<i>Thestor brachycerus</i> LR/nt *
<i>Lepidochrysops lotana</i> CR B1+2c *	<i>Thestor compassbergae</i> VU D2
<i>Lepidochrysops oosthuizeni</i> VU D2	<i>Thestor dryburghi</i> VU D2
<i>Lepidochrysops outeniqua</i> VU D2	<i>Thestor kaplani</i> VU D2
<i>Lepidochrysops penningtoni</i> VU D2	<i>Thestor pringlei</i> VU D2
<i>Lepidochrysops pephredo</i> VU D2 *	<i>Thestor rossouwi</i> VU D2
<i>Lepidochrysops poseidon</i> VU D2	<i>Thestor stepheni</i> VU D2
<i>Lepidochrysops pringlei</i> VU D2	<i>Thestor strutti</i> VU D2
<i>Lepidochrysops quickelbergi</i> VU D2	<i>Thestor swanepoeli</i> VU D2
<i>Lepidochrysops swanepoeli</i> VU D2 *	<i>Thestor tempe</i> VU D2
<i>Lepidochrysops titei</i> VU B1+2c	<i>Thestor yildizae</i> VU B1+2c
<i>Lepidochrysops victori</i> VU D2	<i>Trimenia wallengrenii</i> EN B1+2c *

\*Red = Will be retained in current Red Data Book, but with specifications according to the present assessments under the IUCN (2001) criteria and categories.

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