WILDLIFE DIVISION
(FORESTRY COMMISSION)

REPUBLIC OF GHANA

Wildlife Division Support Project (WDSP)

The Ghana Butterfly Fauna and its Contribution to the Objectives of the Protected Areas System

by Torben B Larsen

(WDSP Report No. 63)

March 2006

In collaboration with:

IUCN
The World Conservation Union

TABLE OF CONTENTS

APPENDICES:

TABLES:

ABBREVIATIONS:

3PT = Cape Three Points
ABRI = African Butterfly Research Institute
ABU = Aburi Botanical Gardens
ANK = Ankasa
ATE = Atewa Range
BIA = Bia
BOA = Boabeng-Fiema
BOB = Bobiri
BOM = Bomfobiri
BUI = Bui
BUN = Bunso
CBAG = Community Based Advisory Group for GSBAs
DIG = Digya
GAM = Gambaga
GSBA = Globally Significant Biodiversity Area
GBE = Gbele
IUCN = IUCN World Conservation Union
KAL = Kalakpa
KAK = Kakum
KOG = Kogyae
KRO = Krokosua
KYA = Kyabobo
MOL = Mole
OWA = Owabi
TL = type locality
SHH = Shai Hills
TOF = Tano Ofin
WLI = Wli Falls/Agumatsa

EXECUTIVE SUMMARY

This report analyses the butterfly fauna of Ghana's protected areas system and assesses the extent to which the structure of the system covers the total fauna and its different ecological and biogeographical components. It also covers eight other localities of special interest that are not within the protected areas system. This is probably the most detailed treatment of the butterfly fauna of any country in tropical Africa and certainly the most thorough in West Africa. The data were assembled between 1993 and 2004 in preparation of the book *Butterflies of West Africa* (Larsen 2005). In addition, two months were spent in Ghana between August and October 2006 with a view to studying the butterflies of Kyabobo as well as a number of localities that had not previously been investigated. A separate report was written on the butterfly fauna of Kyabobo National Park and the Volta Region (Larsen 2006).

Overall findings (table 3.4.1)
Ghana has 925 species of butterflies. Of these, 742 (80%) have been found in one or more of the protected areas under management by the Wildlife Division. Most of the species are forest butterflies, many of which hardly survive serious forest degradation or penetrate savannah country, even along riverine forest. One hundred of these (11%) are endemics to Africa west of the Dahomey Gap. These are not quite as well covered as the bulk of forest butterflies.

About 80% of forest butterflies have been positively recorded from within the protected areas system since 1993. Many rare species known from Ghana doubtless still remain to be collected within the protected areas: many of these are difficult to find because of their specialized habits or strict habitat requirements that may be few and far between inside any given forest. Many species remain to be found. The three main forest parks (Ankasa, Bia, and Kakum) are well chosen to reflect the different types of habitats. They are, however, relatively small – no more than a few percent of the original forest cover and less than ten percent of the existing forest cover. A strong case exists for the enlargement of Ankasa by the addition of Draw River Forest Reserve and the addition of Prah-Suhien to Kakum National Park. The three small areas under protection (Boabeng-Fiema, Owabi, and Wli Falls) are excellent tourist and heritage locations but do not add much to biodiversity protection.

In addition to being relatively small, the three main forests are also about as far from each other as they can be. Much of the remaining forest is destined to disappear or to be severely degraded, with the result that gene-flow will become increasingly difficult. Several existing forest reserves could provide important "stepping-stones" for continued gene-flow, being in good condition with a high level of biodiversity – for instance Boi-Tano, Cape Three Points, and others that are not personally known to the author. Many of the "best" have already been designated as GSBAs but the degree of their protection seems variable: they might be added to the protected areas system, but good long-term protection is more important than precise designations.

However, one serious gap in the protected areas system remains to be filled. The upland evergreen forest of the Atewa Range and the Tano Ofin Forest Reserves contain a fauna that includes a number of strict endemics and numerous species that have been recorded nowhere else in Ghana or in some cases West Africa as a whole. The Atewa Range Forest Reserve is the most important conservation priority in the Ghana subregion (including eastern Côte d'Ivoire) of West Africa (see section 4.2.2 on Atewa for details). The Atewa Range also has significant long-term ecotourism potential.

The wetter forest systems in the Volta Region are concentrated in the central mountains. In both Ghana and Togo these forests have been drastically degraded and reduced

in size in living memory. The only protected area is the splendid, but tiny, Wli Falls Wildlife Sanctuary. In the separate report on Kyabobo/Volta Region (Larsen 2006) it is recommended that whatever remains of semi-deciduous forest in reasonable condition be tied together in a network of forest reserves and community managed sanctuaries. Nature will continue to be an important part of the significant tourism potential of the central mountains. Even now, Wli Falls is fast reaching its tourist carrying capacity.

The Guinea Savannah fauna is well covered by the system. The total area of the savannah in the protected areas system is more than 11,000 km^2, or about eight times larger than the area of forest. Despite a low intensity of collecting, nearly 90% of all potential species (74 out of 93) have been recorded. The remainder will certainly turn up with further collecting. Kalakpa Resource Reserve and Digya National Park has large stretches of forest/savannah transition for future research purposes.

The Sudan Savannah fauna is poorly covered by the system. Investigations during the present mission showed this to be due mainly to the fact that no significant true Sudan Savannah habitats exist in Ghana. More of the Sudanian elements occur in Gambaga East Forest Reserve than elsewhere visited. If there are small patches of true Sudan Savannah north of Bawku these might be accorded special protection. However, the Sudan Savannah is well protected in Burkina Faso, Togo, and Bénin.

Butterflies as indicator species (chapter 2)

Chapter 2 discusses butterflies as indicator species. They are the only larger group of arthropods that are sufficiently well known be used as indicators. The 925 known species in Ghana account for about a quarter of all butterflies found in all of Africa and the off-shore islands.

Section 2.1 argues that butterflies can act as a proxy for total biodiversity, even though most species still remain to be scientifically described. Generally it is accepted that 1.5-1.8 million species have been named, but that the true total is at least ten times higher, possibly much more than that. Using the lower end of these estimates, each butterfly – in a rough and ready manner – can be considered a proxy for at least 800 other organisms. Thus the 925 Ghana butterflies represent 750,000 species in all – and quite likely many more.

One hundred butterflies are endemic to the Ghana Subregion of West Africa, which covers the area of eastern Côte d'Ivoire, Ghana, and the Volta Region. The forests of Côte d'Ivoire have been even more reduced and degraded than those in Ghana. The 100 endemic butterflies represent no less than 80,000 endemic organisms in the subregion, which is a strong argument for continued conservation efforts.

During work on the book on West African butterflies a careful check was made on how many of the forest butterflies known from west of the Dahomey Gap were collected (table 2.6.1). Despite the degradation and shrinkage of forest throughout the region, no less than 95% of all known species were recorded during the 1990s and early 2000s, indicating that no extinction had yet taken place. These species are mainly found in the remaining patches of forest in good condition, the best of which is found in protected areas systems. This should be encouraging for all who are involved in conservation. But the amount of forest now left is so small that continued vigilance and effort is needed to safeguard the future.

Individual localities (chapter 4)

Chapter 4 consists of capsule description of the butterfly fauna of each of the fifteen protected areas in Ghana as well as of eight other locations of special interest (Aburi Botanical Gardens, Atewa Range Forest Reserve, Bobiri Butterfly Sanctuary, Bunso Arboretum, Cape Three Points Forest Reserve, Gambaga Escarpment, Krokosua Hills Forest Reserve, and Tano Ofin Forest Reserve). Each capsule gives a brief overview, a table of estimated butterfly totals

based on the number of species positively recorded, a discussion of some of the most interesting species present, and further notes on any comments on any issues that emerged. The recorded species are listed for each locality in appendices 1a and 1b: an EXCEL spreadsheet with these data that can be updated has been lodged with the Wildlife Division.

Publicity, tourism, education, research, and income

The mission statement of the Wildlife Division (quoted in full in chapter 1) is quite clear that the major objective is the preservation in perpetuity of the natural ecosystems existing in Ghana as well as their attendant flora and fauna. This is a basic responsibility to the people of Ghana now and in future generations. Essential for the achievement of this are a number of subsidiary services and activities that are briefly touched upon in section 5 by the author, who has no special expertise in these subject areas.

The Wildlife Division needs a structured – but not necessary complex – publicity strategy to support its integrity and to assist in the accomplishment of its mission statement. Among the aims would be:

- increase awareness in Ghana concerning conservation purposes and priorities
- support the role of nature and ecotourism as part of Ghana's tourist policies
- secure continued interest and support of conservation donors
- improve Ghana's participation in international research
- enhance the visibility and highlight the successes of the Wildlife Division
- motivate the staff of the Wildlife Division
- motivate existing Community Biodiversity Advisory Committees

Kakum National Park with its canopy walkway and Mole National Park with its elephants have become world-class tourist sites. Kakum has more annual visitors than any other ecotourism site in West Africa. However, the tiny Boabeng-Fiema and Wli Falls Sanctuaries also draw many visitors. Each of the other parks has their attraction: the sacred rocks in Bia, the wonderful waterfall in the middle of Bomfobiri, the beautiful lake of Owabi, the walk along the Ankasa River with the opportunity of bathing – there are rewards for any visitor. The very presence of the protected areas – the fact that they are there as options – are part of the framework that makes Ghana an attractive tourist destination. It is not the role of the Wildlife Division to become a tourist agency, but it has the role of providing options for the tourist industry to exploit. It therefore has to provide the necessary background information as part of its publicity strategy. At present tourism is sometimes looked at mainly as being from abroad. It is likely that in the not too distant future Ghanaians will be more important for tourism than will foreigners. And yet unborn Ghanaians will be very angry if they can longer see the natural heritage of their country.

Ghana has a wide range of mass media (newspapers, magazines, television, radio, internet, etc). Some are fairly sophisticated, some less so. All desperately need good copy concerning any issues relating to Ghana. Regular positive exposure in the mass media can increase the support for and interest in conservation, in addition to providing a better understanding ecology and biodiversity. It should be possible to manage such exposure at little cost. Some examples are discussed in section 5.4.

Ghana could benefit economically and scientifically by establishing international research sites for ecological research in the tropics in collaboration with overseas universities and research institutions. One such programme has tentatively started in Bobiri Butterfly Sanctuary. Among the benefits could be:

- Improved knowledge of the Ghana flora and fauna.
- People on the ground will deter poaching.
- Participation of Ghanaian scientists and students.

- Closer ties with universities and research institutions overseas.
- Income from employment of local staff, accommodation, and food.
- Greater recognition of Ghana and its scientific inputs.

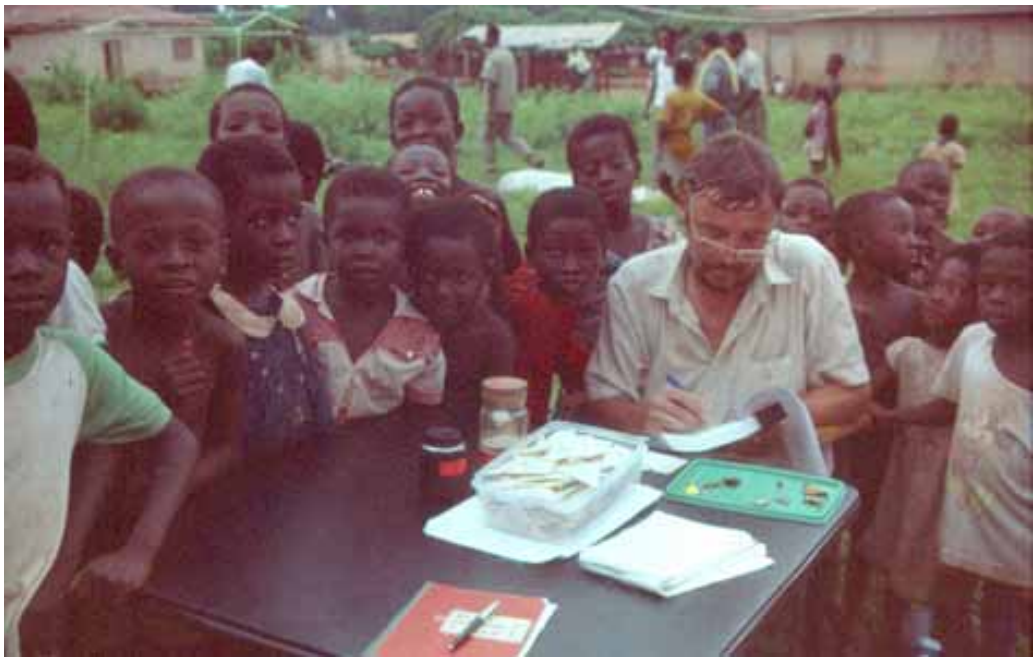
Since 1993 the Wildlife Division has had a liberal attitude towards the collecting of plants and insects for scientific and amateur-scientific purposes. Such liberal policies should be continued. They will pose no threat to conservation of overall biodiversity and will assist in improving knowledge on the flora and fauna. Most of the hundreds of millions of insects and plants deposited in museums all over the world since 1750 were collected by individuals, not by organized scientific collecting activity.

One of the most valuable assets of the Wildlife Division is its staff. Some have good knowledge on some aspects of natural history. Many are interested to know more about the natural history of the area in which they work. Staff are also the interface between the Wildlife Division and its visitors but they need better training in how to show visitors interesting aspects of natural history. Improved ways in maintaining and improving the knowledge of staff must be developed and responsibility be assigned for ensuring a flow of information down to junior staff in the field.

As part of improving the communication processes, the author will try to find a publisher for a book on butterflies in Ghana, to be written as a volunteer input, which can also be used by the Wildlife Division.

Concluding remarks

This in-depth study of butterflies indicates that the ecological coverage, with the exception of upland forest, protects most of Ghana's known and unknown biodiversity. Let us hope that the remaining natural habitats in Ghana will not be remembered though a long series of "fossils on a pin". Let us hope that they will remain as a natural heritage that can give pleasure and inspiration to the people of Ghana, that will allow visitors from abroad an insight into tropical biodiversity, and that will permit scientists to study and describe the hundreds of thousands of organisms in Ghana that are as yet unknown.



The next generation of entomologists getting ready in Boabeng-Fiema (1993)

ACKNOWLEDGEMENTS

The author would like to thank the Executive Director of the Wildlife Division, Forestry Commission (Y. Ofori-Frimpong) and the Regional Director of IUCN (I. Thiaw) for the invitation to undertake this assessment of the coverage by the protected areas system in Ghana through the means of the butterfly fauna. The Wildlife Division staff at headquarters in Accra continued a tradition of collaboration that dates back to 1993 when work was started on the recently published book *Butterflies of West Africa* (Larsen 2005). Also at headquarters much assistance was received from the IUCN/WDSP Project advisors, Peter Howard and Phil Marshall. George Issaka was deputed to be the driver for the mission, a role which he fulfilled with efficiency, care, and a well-developed sense of humour. Only three times during two months of driving through most of Ghana was he obliged to admit: "I have never been here before".

As always Park Managers and their staff were welcoming and helpful. Many were old friends and colleagues in new settings. More than on previous occasions, junior staff with a considerable degree of knowledge concerning certain aspects of the parks or the flora and fauna were encountered – some of which now also have a degree of knowledge about butterflies.

Thanks are also due to staff at the Bunso Arboretum, the Bobiri Butterfly Sanctuary, Gambaga East Forest Reserve, Tano Ofin Forest Reserve, and to Nana Azia-Ntoa III of Tumentu Village, who is a strong protector of Cape Three Points Forest Reserve: all gave their assistance despite no advance warning of our visits.

Hein Boersma, a Dutch entomologist, joined the visits to the Volta Region and assisted in the data collecting. He also spent two weeks and Bobiri Butterfly Sanctuary and helped to lay the foundations for a full inventory of its butterfly fauna. Kwaku Aduse-Poko (Institute of Renewable Natural Resources, University of Science and Technology, Kumasi) provided data from his own butterfly research in Ghana as well as assisting with numerous practical issues. Finally Richard Vorgas, with his usual efficiency and ability to find good collecting sites, provided a profuse butterfly material from Kyabobo National Park, placing it among the best researched single localities anywhere in Africa.

The Mission vehicle in riverine habitat on the Volta River, Hunter's Camp. It was "home" for two months.

1. INTRODUCTION

1.1 Background to the present mission

The author spent much of the period from 1993 to 2005 working on the book, *Butterflies of West Africa* (Larsen 2005), that was actually published during the present mission. Much of the field research concerning the habitats, ecology, and behaviour of the West African butterflies was undertaken in Ghana. In 1993 G. Punguse, then Chief Wildlife Officer, requested that these studies – to the extent possible – should take place in the National Parks, which was a very acceptable proposal. The author was also requested by IUCN to present a report analyzing the butterfly fauna as an indication for conservation priorities and a report was submitted in early 1994, despite the relatively brief time available (the author spent almost five months in the field in Ghana during 1993) (Larsen 1994).

The present mission was undertaken from 8 August till 20 October 2005 and was to some extent a continuation of the previous IUCN research. During the past ten years most attention had been paid to the national parks in the forest zone so one of the priorities for the present mission was to study those parks not previously visited (Kalakpa, Digya, Bui, Gbele, Bomfobiri). In addition it was suggested that some areas of potential conservation interest such as Cape Three Points and the Gambaga Escarpment be studied, to which the author added the Bobiri Butterfly Sanctuary and the upland forests of the Tano Ofin Forest Reserve.

The assembled data of the report are the most detailed for any tropical African country, though Uganda also has an excellent set of surveys (Davenport (1996), Howard *et al.* (1998).

1.2 Objectives of the present mission

The objectives of the present mission were initially devoted to the study of the butterfly biodiversity in the new Kyabobo National Park, which the author had first visited in 1996. The original terms of reference gradually evolved towards a study that would use butterflies as indicators for overall conservation policies in Ghana and the development of the protected areas system as a whole (the term “protected areas” is here used for all those under the management of the Wildlife Division (National Parks, Resource Reserve, Sanctuaries, Strict Nature Reserves, etc). The objectives were finally broadened to provide comment on some of the most interesting habitats not currently included within the purview of the Wildlife Division.

RAMSAR sites were not included in the survey. Even those that have mangrove fauna do not seem to have any butterflies of interest. It was not adjudged necessary to make personal visits. Even the very rich and well-developed mangroves of the Lekki Sanctuary near Lagos had no butterflies of interest. H. Boersma (pers. comm.) spent several days in the extensive mangroves of the Niger Delta without finding any evidence of interesting butterflies.

The outputs of the mission will consist three main reports and a spreadsheet:

1) The Ghana butterfly fauna and its contribution to the objectives of the protected areas system in Ghana (comprising analysis of the data in appendices 1a and 1b).

2) The butterflies of Kyabobo National Park, Ghana and those of the Volta Region (Ghana and Togo) (Larsen 2006).

3) The butterflies of the Bobiri Butterfly Sanctuary (to be co-authored by H. Boersma).

4) An Excel spreadsheet that comprises all firm butterfly records from 23 localities in Ghana and some supplementary data. The spreadsheet will continue to be updated and the new versions will be sent to the Wildlife Division as updating takes place (that is the source for the appendices to the present report).

In approaching the objectives, the mission statement of the Wildlife Division was kept in mind:

"Wildlife Division Mission Statement"

The Wildlife Division will work effectively with others to ensure sustainable management of Ghana's wildlife and their habitats, so as to optimise their contributions to national socio-economic development.

Objectives for protected areas

To preserve examples of natural ecosystems representative of those occurring in Ghana.
To conserve sites of biological importance and natural scenic beauty.
To ensure that viable populations of all indigenous wild species including passage migrants are adequately conserved and that rare, endangered endemics and species of high conservation interest are specially protected.
To protect and maintain ecological and life-sustaining processes such as catchments protection, soil conservation and genetic diversity.
To provide opportunities for research, education, recreation and tourism.
To generate economic activities in and around protected areas and promote the sustainable use of wildlife.
To protect and maintain cultural resources."

Before embarking on the mission, the author had tried to formulate what he personally believed might be the most important objectives of Ghana's protected areas system. They turned out to be rather close to the formal objectives above. They differed in one main respect, which is that of Ghana's cultural heritage and its age-old relations to the forests and its various animals. Since forests – and especially larger mammals – outside the system are destined to disappear or nearly so in a not too distant future, the preservation of this link with the past is an important one. What will Winneba do when the royal no longer occurs in the area? Already, many young people in Ghana have never seen a real forest. Some years ago the author found himself in Kakum National Park surrounded by a graduating class of young men and women from the merchant navy academy – all emerging from the forest in their fine white uniforms – some no longer spotless. They had decided to choose Kakum for their "graduation day picnic". After being shown some interesting butterflies and given a small

lecture on biodiversity, they were asked what they thought of the Kakum experience. One answer summarized their opinion: “Most of us never saw a forest like this ... now we can better understand the stories that out grandfathers told us!” This aspect of conservation might also assist in enhancing the political visibility and importance of the protected areas system.

The role of nature conservation for the benefit of Ghanaian heritage has not been sufficiently stressed – though it is implied in the last point of the mission statement objectives. The knowledge that nature conservation is an integrated part of Ghana’s own heritage will increase the value of protected areas also for visiting outsiders.

One further – personal – objective might be mentioned: this was the first opportunity of checking the new book *Butterflies of West Africa* (Larsen 2005) under field conditions in areas not previously visited. The book stood up well to the observations made during the mission.

Finally it must be emphasized that the report was written over four months in several different countries. There are very minor discrepancies between some of the figures quoted and the final updated versions of the Ghana butterflies as listed in appendices 1a and 1b. Continued collecting will continue to change the statistics in the report, but the data are sufficiently good to warrant that the conclusions drawn will not be changed.

Fig. 1.1. The small skipper *Meza meza* drinking nectar from a plant that looks like it is designed for the purpose – as indeed it is!

2. BUTTERFLIES AS INDICATOR SPECIES

Butterflies are useful indicator species for a number of reasons:

- the species numbers (4,000 in Africa) are significant, but not overwhelming, and they do not break down into "micro-species" with very small ranges,
- they are taxonomically relatively well known, with most of the species having already been described,
- they are relatively easy to identify thanks to an extensive literature; West Africa was less well covered than much of Africa till the publication of Larsen (2005),
- their African and global distributions are better documented than for other arthropods, and more is known about their habitat preferences,
- their evolutionary history can be traced back to the Miocene, and some evaluation of the significance of present distribution patterns can be made,
- their present distributions provide a current snapshot of complex biogeographical processes.

One of the main purposes of writing the book *Butterflies of West Africa* (Larsen 2005) was to facilitate the use of butterflies as indicator species for nature conservation in West Africa.

2.1 Butterflies as indicators for overall biodiversity

Butterflies can serve – in a rough and ready manner –as proxies for terrestrial arthropod biodiversity as a whole. Most butterfly are now known (though detailed DNA studies promise (or threaten) to increase numbers): so far studies have not actually resulted in this, though once geographical variation is studied, the picture might change (a neotropical skipper was recently broken up into ten species, but there were already indications that a number of species were subsumed under one name). Butterflies are by far the best known and most studied larger group of organisms apart from plants and vertebrates.

The 20,000 species butterfly species account for about 1.5% of all described and named organisms, of which there are 1.5 to 1.8 million according to most estimates. No database of valid, named species exists. More than a million of these arthropods, and probably a million are terrestrial arthropods, mainly insects. Most of these are tropical species because biodiversity levels in the tropics are much higher than in temperate climates (there are nearly twice as many species of butterflies on the Atewa Range in Ghana than in all of Europe).

On a worldwide scale this means that for every butterfly species there are 75 – 90 other named organisms. Assuming that in a "rough and ready" manner butterflies can act as a proxy for other organisms, the 925 species in Ghana would represent a total a total of some 69,000 – 83,000 organisms. However, that would be a gross underestimate. Only plants, vertebrates, butterflies, and a few minor groups of other animals of economic importance are anywhere near fully enumerated. Parasitic wasps, flies with all sorts of curious life-styles, and many groups of beetles are strongly under-counted. Myriads of minute soil arthropods remain almost untouched by taxonomists. This is true for fungi and most micro-organisms as well.

The true number of living organisms is almost certainly ten times more than those actually described and named – some would say the total is at least 30 times higher, perhaps even

more. Using the low range of these guesstimates, each butterfly in Ghana would thus act as a proxy for 750 – 900 other organisms. The 925 Ghana butterflies indicate a total of 690,000 – 830,000 species in Ghana, probably at least 1,000,000, and possibly many more. Most of these are undescribed and we know nothing about them.

The above figures are admittedly rough and ready. They are based on the heroic assumption that the ratio of butterflies to all other organisms is a constant: but they are perhaps not all that heroic. Butterflies are part of the huge arthropod package mainly of the wet tropical countries. The similarities between the quantitative and qualitative aspects of the butterfly fauna in the Neotropical, the Oriental, and the Afrotropical Regions are great. The Neotropical Region has about twice as many butterflies as the two other regions, but the Neotropics are generally considered to have more biodiversity than anywhere else. In all regions butterflies fit into the general web of life in the same manner, have their own spectra of predators and parasites, and are themselves important parasites on plants. In any case, the margins of error are not really that important: the biodiversity indicated by the butterflies is almost unimaginable. And that is the biodiversity which the protected areas system is meant to preserve for future generations.

So from time to time stop briefly when reading this report to remember that every butterfly mentioned is a proxy for 800 other species about most of which we know practically nothing.

2.2 Butterflies as indicators of comparative diversity

Africa has a reputation for having a less diverse flora and fauna than other tropical regions. Evidently, the Neotropics are richer than Africa, with some 8,000 butterfly species compared to 4,000 in tropical Africa, but it is richer than the Oriental Region which is estimated to hold about 2,700 - 3,000 (see Larsen 2005).

Single localities in Brazil and the Peruvian Amazon may have as many as 1,500 (even 2,000) butterfly species, but Africa does not do badly. During two one-month visits to the Oban Hills near Calabar in southeastern Nigeria, my team collected about 600 butterfly species and the total number ever recorded is more than 800. The present estimate, based on both geographical distributions and a projection of my own collecting curve, is that the Oban Hills have almost exactly 1,000 species - an amazing 27% of the continent's total fauna. Certainly no locality in the Oriental Region even begins to approach this number, which is almost the same as that for all of peninsular Malaysia. At least as far as butterflies are concerned, the Oban Hills and the contiguous Korup National Park in Cameroun are the richest in Africa with 1,100 species in all (Larsen 1997d).

West of the Dahomey Gap, levels of butterfly biodiversity drop. Good rainforests have butterfly faunae of some 650-700 species according to the estimates in the present report. Apart from the Oban Hills/Korup estimate of 1,100 species, few in-depth studies are available. Libert (1994) found some 800 on two mountains (Mt Messa and Mt Fébé) near Yaoundé. He invested a total of 2,000 collecting hours and had effectively reached the point where additional species no longer turned up. Kakamega Forest in Kenya, at the eastern fringes of the rainforest zone has just under 500 – and that only because of s substantial savannah element add to the total.

As one leaves the forest zone butterfly diversity drops off quickly along the rainfall gradients. In the Guinea Savannah there are only 150 species or so, and the numbers in the Sahel is even lower.

2.3 Butterflies as ecological indicator species

Most butterflies have special geographical distributions, reflecting past conditions, and most have distinct ecological preferences. When butterfly distributions are well known, they can be used as indicators for whether the protected areas cover all major zones of ecological interest. The contrast in butterfly populations in different ecological zones can be quite striking. The forest zone has numerous species that never intrude onto savannah habitats. But even within the forest zone some species may be found only in the wettest forests and some only in the driest. Thus, if Ankasa were not part of the protected areas system, several butterfly species would immediately point to the desirability of including it. In the same way the Guinea Savannah is characterized by a small set of species that hardly penetrate the dry forests to the south or the Sudan Savannah to the north, the distribution of which form a narrow band from Senegal to the Central African Republic and beyond.

Table 2.3.1. The ecological composition of the butterfly in Ghana by forest and savannah, including subtypes.

Ecological zone (from appendix 1a)	**Ghana total**	**Percent of total**		**Forest/ savannah**
WEF – wet evergreen forest	245	26%	}	
MEF – moist evergreen forest	271	29%	}	
ALF – all forest types	172	19%	}	
DRF – dry forest specialists	68	7%	}	
= Total forest species: 756				81%
GUI – Guinea Savannah*	82	9%	}	
SUD – Sudan Savannah	48	5%	}	
UBQ – ubiquitous species	33	4%	}	
= Total savannah species: 163				18%
??? – not assigned	6	n.a.		
TOTAL	**925**	**100%**		**100%**

* includes 4 species of special habitats

It is generally relatively easy by studying the distributions of species and their closest relatives within all of Africa to decide which should be considered forest and which savannah species. As will be discussed later a limited number of forest species do invade the savannah, mainly along riverine forest, but most are quite incapable of doing so. Some savannah species can invade degraded areas of the forest zone, others cannot. The assignment to subcategories is not quite so simple, since the distribution of many species within the forest zone is not yet

well known. The system used in this report was first developed by Larsen (1994) and then updated in conjunction with a study of Ankasa and Bia National Parks in 2000 (Larsen 2001). Generally the classification seems reasonably robust, thou a few species need to be reassigned to other categories.

It will be seen that four-fifths of all Ghana's 925 butterflies are forest species and that within the ecological categories are well differentiated. Some 172 species can be said to be generally distributed within the forest zone (ALF). Only a small proportion (68 species) is centered on the driest forests, those that are fringing the main forest zone at its northern limits (DRF). The bulk of the forest fauna is divided roughly 60/40 into those centered on the wetter forests of the evergreen type and those centered on moist forests, including the wet and moist semi-deciduous types.

2.4 Butterflies as biogeographical indicator species

Butterflies in West Africa are excellent biogeographical indicators. Narrowly endemic species are relatively few, but they are all correlated with exceptional features, especially mountains which may be presumed from time to time to have been forested islands in a sea of savannah, testifying to several periods of radical climatic changes.

In particular, the presence of the Dahomey Gap (a tongue of savannah country that currently separates the forests of Ghana and the rest of West Africa from those of Nigeria and the equatorial area) has led to the evolution of a significant number of species that are only found west of the gap – the West African endemic species. About one in every eight forest butterflies ate West African endemics: their conservation must be among the highest priorities of the protected areas system.

The composition of the butterfly fauna of the Volta Region (the term being used for the Ghana/Togo Mountains and the surrounding lowlands is quite special and is treated in the separate report on the Kyabobo National Park and the Volta Region (Larsen 2006).

2.5 Butterflies as conservation indicators

Butterflies can also act as conservation indicators. If a given locality has a large proportion of all the species that might be expected that is an indication we are faced with at least a well-developed ecosystem with a high degree of biodiversity. The presence of many species that are rare throughout Africa is a useful additional indicator. However, a rich overall biodiversity is not necessarily the most important indicator of conservation value. The presence of endemic species, and especially narrowly endemic species, may be more important. One example in West Africa is the archipelago of submontane areas along the Nigeria/Cameroun border. Species numbers are not high – less than 20% of the surrounding forests – but the bulk of the fauna is either endemic or represents species recurring only several thousand kilometres away in the East African mountains. If both high levels of biodiversity in general and a degree of endemism are present in the same locality that is an indication of significant conservation value. The Atewa Range in Ghana is one such special locality, as will be discussed in detail later in the report.

In many European countries natural habitats have been changed by gradual, natural climate changes as well as through reduction and/or degradation of habitats – with changing agricultural and silvicultural practices as the main culprits. This has led to increasing

emphasis on the protection of individual endangered species. The question is often raised whether species conservation is needed in Africa. With rare exceptions, the answer is no. Most attempts at species conservation were actually unsuccessful. The necessary background knowledge on the biologic and habitat requirements of the species in question were not well understood. Many of the endangered species were in any case at the very edges of their natural distribution limits, where they survived only under very special conditions – exactly where one might expect local extinctions of some populations and – perhaps – sometimes re-establishment in others. There are species in Africa that are endangered, living in small populations in limited areas. Two examples from West Africa are: *Mylothris atewa* Berger, 1970 on the Atewa Range in Ghana and *Charaxes chevroti* Collins & Larsen, 2005 in the Kagoro Forest in Nigeria. Little is known about the biology and requirements of these two butterflies: what is known is that if the small forests in which they live disappear, so will the butterflies. Such species are better used as flagships for conservation of the Atewa Range and Kagoro Forests as continued ecosystems rather than conservation objects on their own.

2.6 Butterflies as indicators of extinction

Natural habitats in good condition have been shrinking fast in West Africa and Ghana, with the inexorable growth in population for more than 100 years being the major factor. Worst hit are the forests. Probably no more than 10-15% of the original forest area remains. Of these only about a third can be said to be in pristine or only lightly damaged condition. Virtually all the remaining forest is now either in protected areas system or in forests controlled by forestry departments. The savannah habitats are better off, especially the Guinea Savannahs where the tsetse fly kept human populations at lower levels than in the forest zone. But not least in Nigeria most of the Sudan Savannah has a much denser human population.

In order to gain an impression of the extent that extinction might have taken a toll of the West African butterfly fauna, the author decided to monitor the records of the forest zone butterflies west of the Dahomey Gap. This slightly restricted choice of coverage was due to the fact that the dry zone fauna – especially in the Sahel countries – was being collected only intermittently and that of Nigeria not in depth during the 1980s and 1990s. The list of species included in this monitoring came to 970 that had been reliably recorded from the forest zone west of the Dahomey Gap.

Surprisingly, as shown in table 2.6.1, virtually all 970 species were reliably recorded during the four and half decades between 1960 and today. Even more surprisingly 95% of all known species were recorded between 1990 and today. Effectively the conclusion must be that as yet virtually no species has become extinct in West Africa. Most of the fifty or so missed during the 1990-2000 period are genuinely rare butterflies, often of the ‘once in a lifetime’ category that one would not expect to find over a ten year period (there are probably 25 species of *Pseudaletis* in Africa; since 1967 the author has collected just six specimens of three species, and just two *P. leonis* west of the Dahomey Gap). Half of the fifty missing species have been found elsewhere in Africa.

Table 2.6.1. Described forest species from west of the Dahomey Gap known to be present during the 1960-2000s, 1980-2000s, and 1990-2000s periods (all species from later dates are assumed to have been present also in 1960).

Forest species recorded	1960-2000s	1980 - 2000s	1990 - 2000s
Present in WA	967	930	921
Elsewhere in Africa	1	21	24
No records at all	2	19	25
TOTAL SPECIES	970	970	970
Present in WA	99%	96%	95%
Elsewhere in Africa	0+	2%	2%
No records at all	0+	2%	3%
TOTAL	100%	100%	100%

Source: Larsen (2005) A few recent taxonomic revisions are not fully integrated in the data.

Table 2.6.1 shows that as far as butterflies are concerned the most apocalyptic predictions on extinction have not yet come to pass. This is also true for the few other animals of which we have sufficient knowledge. No West African mammal or bird is known to be extinct. In fact improved exploration by ornithologists has taken several species off their status as threatened, including the white-breasted guineafowl (*Agelastes meleagrides*), once thought to be on the brink of extinction. Even the birds of the Nigeria/Cameroun Mountains all seem to survive, though they started out with tiny total ranges that have been considerably degraded. While their numbers and ranges have decreased precipitously, all mammals still seem to survive (however, the Ghana subspecies of the red colobus monkey has not been seen with certainty during the past decade). Even the pigmy hippopotamus still seems to exist in Liberia. In fact, it appears that the only two mammal species that are definitely known to be extinct on the African mainland are the blauwbok and the quagga, both hunted to extinction in South Africa quite some time ago. If the butterflies survive, it is likely that most other arthropods do as well, though possibly aquatic species that can be localized to small, ancient fresh-water catchments areas may be less robust than the terrestrial.

Thus, the most exaggerated predictions of extinction have not yet come true: but this should in no way be an argument for complacency. All our biodiversity eggs are now in a very small basket of national parks and conservation areas. And that basket is severely threatened by poaching, illegal logging, and farm encroachment. This lack of extinction must be considered a very close-run thing. We are probably now close to the brink.

However, the data should still be encouraging to all who are engaged in conservation – it does work. Without the foresight of the forest conservators in colonial days who reserved forests as watersheds and biological reserves, and without the conversion of some to be protected areas under the current system instituted by the Ghana government, the situation would certainly have been worse. Let us hope that wisdom and good luck will combine to allow the same conclusions to be drawn fifty and a hundred years from now [the author would dearly love to re-survey the butterflies of Kakum National Park in 2105, but realizes this will probably not be possible, though a fairly good baseline is now available!]

2.7 Discussion

The author's personal experience is that butterflies are a useful proxy for invertebrate biodiversity as a whole. The results of the present mission have only strengthened this belief.

Lawton *et al*. (1998) – in a paper to which the author contributed – have been widely quoted for the view that no single group of organisms can act as a reliable indicator group for biodiversity as a whole. This represents a too narrow interpretation of the data, which are based on comparisons between small plots of the forest that have been subject to different major perturbations. Thus, for example, it is hardly surprising that different organisms react differently to – say – a complete elimination of the canopy.

Vanclay (2004) points out that an entire forest will not normally encounter the same changes throughout and that the perturbations will be evened out: "A series of faunal surveys in the Mbalmayo Forest Reserve in Cameroon suggest that it may be possible to devise faunal bioindicators. The species richness of birds, of butterflies and of termites is significantly correlated with total faunal richness across eight species groups, suggesting that these groups may have potential as bioindicators, alone or in combination." Thus, while differences between small plots deliberately selected as being potentially different may be large, this need not apply to the forest as a whole, since larger areas will have a diversity of sub-habitats.

During the present mission, for example, judging from the data of Dowsett-Lemaire & Dowsett (2005) it seems clear that butterflies and birds in the forest zone show parallel variation in biodiversity.

3. BUTTERFLIES OF THE PROTECTED AREAS SYSTEM

3.1 Material and methods

During the period from 1993 to 2004 the author conducted much of his field-work for the book *Butterflies of West Africa* in Ghana. During this period 10 of the 15 components of the protected areas in Ghana were studied in some detail. Data were also gleaned from the general literature and museums, but especially from the collecting activities of Father Maessen, C. Belcastro, and the collectors of the African Butterfly Research Institute, Nairobi. Most of the particularly interesting records are included in the book, *Butterflies of West Africa* (Larsen 2005a), but appendices 1a and 1b are the first systematic use of the data.

A major objective during the present mission was to visit those protected areas that were not previously seen (Kalakpa, Bomfobiri, Digya, Gbele, Bui). These visits could not be comprehensive: one would ideally have liked several week-long visits during various times of the year.

Since Kyabobo National Park was at the centre of the original operational plan, a very experienced Ghanaian collector, R. Vorgas, was hired to do studies there in advance of the general mission. His two visits of a fortnight each provided a significant contribution, allowing a very detailed list of the Kyabobo fauna, when seen in conjunction with earlier data and those found during the present mission. More than 400 species are now positively known from the park and the estimated total is about 500 (almost 80% of all species known from the Volta Region).

A number of forests had been studied in such depth during earlier visits that further investment of time did not seem appropriate (Ankasa, Kakum, Bia, Boabeng-Fiema, Kogyae, and Mole). Because of their convenient location, brief re-visits were paid to Wli Falls, Owabi, and Shai Hills.

Bobiri Forest Reserve west of Kumasi – presently managed by the Forest Research Institute of Ghana (FORIG) – was made a special research station during colonial times. It was designated as a “butterfly sanctuary” a few years ago and advertised as such by the Ghana tourist industry. Though never visited by the author, he is quoted on the internet as saying that 400 butterfly species were present in the sanctuary. Since H. Boersma volunteered to join the present mission, two weeks of his time was devoted to conducting a butterfly survey at Bobiri.

A brief familiarization visit was paid to Tano Ofin Forest Reserve, which has the only major area of upland forest second to the Atewa Range, though its plant “genetic heat index” is not as high. Also visited was the eastern part of Cape Three Points Forest Reserve. Since Bunso Arboretum is advertised as being a butterfly sanctuary, a brief visit was made there as well.

In all, eight sites outside of the protected areas system are included in the analysis. The most important of these is the Atewa Range GSBA. By any standards the Atewa Range is the most urgent conservation area in Ghana, far outranking any of the present protected areas. Its butterfly fauna is already well known and no additional collecting took place during the present mission. The very special habitat of Aburi Botanical Gardens was not re-visited for the same reason.

Though the bulk of the data included in the report are those of the author, there are additional data the sources, which are acknowledged in the sections dealing with the individual localities. The data in appendices 1a and 1b are the most detailed and comprehensive for any part of tropical Africa. A similar approach was undertaken in Uganda, where butterflies were only one of several groups of organisms included (Howard *et al*. 1998). The interesting butterfly data from these surveys were published by Davenport (1996).

Table 3.1.1. Estimated number of butterfly species in the protected areas system of the Wildlife Division and in other localities of special interest.

Protected areas	Species estimate	**Other localities**	Species estimate
Ankasa/Nini-Suhien	639	Aburi Botanical Gardens.	371
Bia National Park	668	Atewa Range (GSBA)	697
Boabeng-Fiema Sanctuary	452	Bobiri Butterfly Sanctuary	483
Bomfobiri Nature Sanctuary	144	Bunso Arboretum	200-250
Bui National Park	215	Cape Three Pts (GSBA)	537
Digya National Park	189	Gambaga Scarp	168
Gbele Resource Reserve	127	Krokosua Hills FR (GSBA)	626
Kalakpa National Park	227	Tano Ofin (GSBA)	640
Kakum/Attandanso	627		
Kogyae Strict Nature Reserve	163		
Kyabobo National Park	495		
Mole National Park	149		
Owabi Wildlife Sanctuary	410		
Shai Hills Resource Reserve	139		
Wli Falls	503	**GHANA actual total**	**925**

3.2 Ghana butterflies and the main ecological zones

The present list of Ghana butterflies as given in Appendix 1 comprises 925 species, almost a quarter of the 4,000 known to occur in the Afrotropical Region. When the “Butterflies of West Africa” project started in 1993, an educated guess at the Ghana Fauna would have been about 700.

Just a few of these butterflies are found throughout Ghana (see discussion and list of the 33 ubiquitous species in table 3.3.9). Most are limited to more or less restricted ecological zones. With some exceptions there is a gradation from wetter to drier forests from just north of the coast to the level of about 5-7 degrees north. Here begins a transition to Guinea woodlands and open savannah that stretches to about 10 degrees north (further north in Sierra Leone and Senegal) when it is replaced by Sudan Savannah, a habitat that barely touches the northeast of Ghana and which is floristically and faunistically very different. The Sahel zone forms a transition between the Sudan Savannah and the Saharan sub-deserts and deserts. It lies well to

the north of Ghana and few of its characteristic species reach that far south. The forest zone is often referred to as the Guineo-Congolian biome, a somewhat clumsy term that ignores the fact that the forest zone has many subdivisions of which the Congolian [*sensu strictu*] is not even the most important. The savannah zones are often referred to as the Sudanian biome. The differences when moving from the edge of the forest to the edges of the Sahara are such that the traditional West African classifications are adhered to here. The main ecological zonation is shown in the map below:

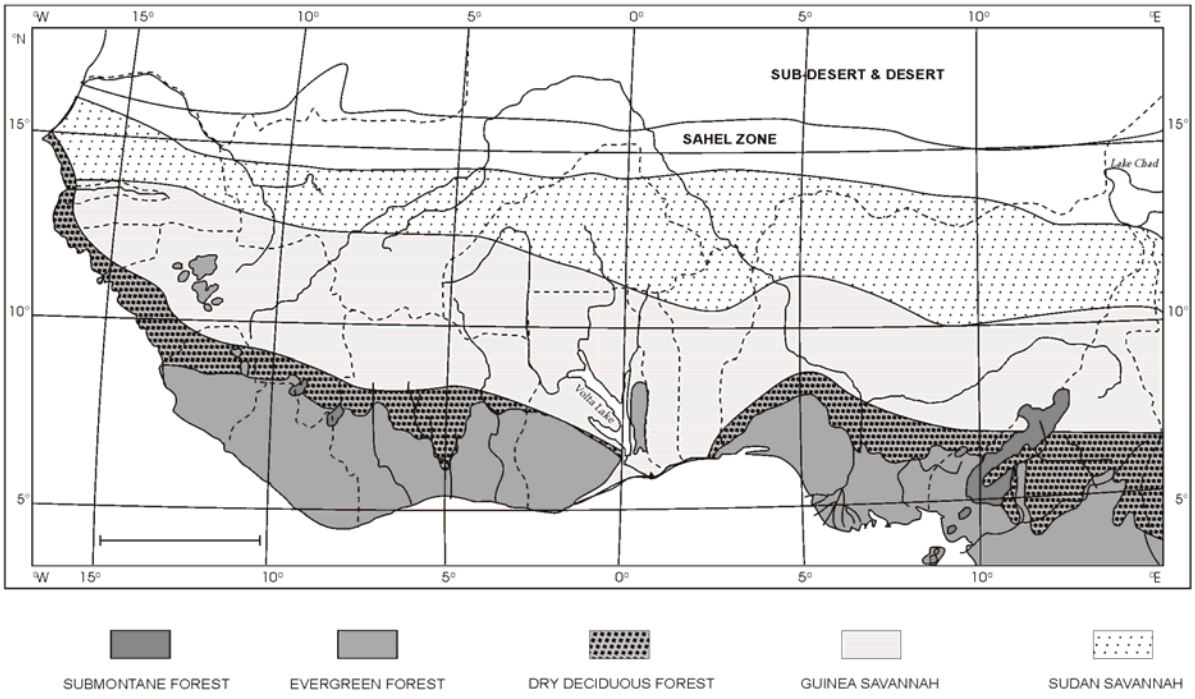


Fig. 3.2. Map of the main ecological zones of West Africa (Larsen 2005).

A further feature on the map is that in Togo and Bénin a tongue of savannah stretches south right to the coast, and turns west to form the Accra Plains, even stretching along the coast to Cape Coast. This is the Dahomey Gap, which is a significant biogeographical feature. Today it practically stops faunal interchange between the forests of Ghana and Nigeria, but it has waxed and waned with changes in climate. At times, the gap has been wholly bridged by evergreen forest, at other times it has been very much wider, with rainforest being limited to isolated patches here and there, with Ankasa/Grand Bassam and Liberia being the most important, giving rise to the Liberia and Ghana Subregions of the forest zone. As a result of these perturbations the forest fauna west of the gap (the Upper Guineo-Congolian forests) contains an important endemic forest element – species that are found only in West Africa or parts thereof. Given the objectives of the Wildlife Division the protection of such endemic species is a high priority (see later).

3.3 Coverage of butterflies by the protected areas system

3.3.1 Overall coverage of butterflies by the protected areas system

Ideally a protected areas system should cover and protect all fauna and flora in a given country in perpetuity. This will only be obtained if the areas covered are sufficiently large and with the necessary habitat conditions to ensure viable populations of the various organisms. The minimum size of a protected area is larger for a large organism such as the elephant than it is for an individual butterfly. However, in butterflies the extinction of discrete populations of many species are well known, most extensively in the checkerspot butterflies of North America (*Euphydryas* sp.), which have been intensively studied under the aegis of Paul Ehrlich (see Ehrlich & Hanski 2004). Some species actually specialize in disturbed areas of the forest and establish population that die out as that area regenerates, while new disturbed areas are immediately colonized.

The forest butterflies in Ghana often require somewhat different ecological conditions and the total species spectrum has its special elements. Some are found only in the wettest forest types, others are found only in the rather special upland forests, while yet others occur only in the drier semi-deciduous forests where they begin to approach the savannah habitats. Some actually prefer secondary growth near forest in prime condition. No single forest can be expected to house all the Ghana forest butterflies.

The butterfly composition of the savannah habitats seems to be more stable than in the forest habitats, though there is a strong contrast between the Guinea and the Sudan Savannahs. In Ghana (see later) the Sudan Savannah elements do not seem to have a natural home and are scattered in an unpredictable manner across the extreme north of the country along the Burkina Faso frontier.

As shown in Appendix 1a, 742 butterfly species have been recorded with certainty from within the protected areas system, which is 80% of the total of 925. Another 183 (20%) have not been recorded. This means that four out of every five butterflies known from Ghana have been positively recorded from within the protected areas system. What does one make of this statistic? Is the glass half full or half empty?

First of all it is necessary to remember that not all species actually present within the protected areas system have yet been positively recorded. During collecting trips under the author's supervision, 753 (81%) of the 925 Ghana species were recorded (listing in appendix 1b) – of these 704 were recorded inside the protected areas system, so 50 0f the known were species were not found by the author. The number of species continues to grow, but at a very slow rate (see table 3.3.1) of about one additional species for every two field-days invested. More collecting within the protected areas system will certainly continue to yield additional species.

Many of the missing species are difficult to come by under any circumstances: from Ghana the following are known only from single captures or from single localities that are neither within the protected areas nor on the Atewa Range: *Mimeresia debora catori* Bethune-Baker, 1904 from "Kumasi"; *Eresiomera jacksoni* Stempffer, 1969 from the Aburi Scarp; *Liptena tiassale* Stempffer, 1969 from Aburi; *Liptena seyboui* Larsen & Warren-Gash, 2001 from Tano Ofin; *Cephetola collinsi* Libert & Larsen, 1999; *Pseudaletis subangulata* Talbot, 1935 from "Gold Coast"; *Iolaus theodori* Stempffer, 1970; *Iolaus likpe* Collins & Larsen, 2004;

Anthene radiata Bethune-Baker, 1910 from near Takoradi; *Abisara tantalus tantalus* Hewitson, 1861 from "Ashanti"; *Euriphene leonis* Aurivillius, 1898 from Cape Three Points (and perhaps one other); *Melphina maximiliani* Belcastro & Larsen, 2005 from near Cape Coast (Kissi); *Fresna maesseni* Miller, 1971 from the Likpe area in Volta Region (small series); and *Platylesches rossi* Belcastro, 1986 from Likpe, Volta Region. There are more than the twelve examples listed here, and many of them may eventually be found inside the protected areas system.

Table 3.3.1. Approximate number of field-days and cumulative number of species personally collected (Oban Hills and Ghana) by Torben B. Larsen.@

Cumulative number of field-days*	Cumulative species recorded Oban	%	Ghana	%
10 field-days	350	35	300	31
22 -	430	43	360	39
40 -	490	49	470	51
60 -	580	58	540	58
85 -	--	--	580	63
210 -	--	--	713	77
260 -	--	--	753	81
Estimate of total	1,000	100	925	100

* A field-day is defined as 4.5 hours collecting under good conditions. A full day with little sun would rate half a field-day.

@ During the present mission 400 species were recorded – given much poor weather and much time spent in species-poor savannah country, this accords well with the Ghana figures in the table.

About 60 species are known only from the Atewa Range, of which ten are West African endemics. Maybe half of these are genuinely not to be found in the protected areas system, being adapted to the special ecology of Atewa. Many of these are rare anywhere in Africa. With as many 572 species actually recorded (697 estimated) a larger number of rare species might be expected in the total. If the Atewa data were added to the list from protected areas, the total coverage would become 88% of the Ghana total. This is a further argument for giving the highest possible conservation status to the Atewa Range GSBA.

Many of the 20 Sudan Savannah species missing from the protected areas (see table 3.3.8) will eventually turn up in Mole or Gbele, but some may not. However, it would seem that the Sudanian element is not an integral part of the basic Ghana fauna, and some may not even be genuine residents.

The overall coverage of butterflies by the protected areas system thus seems to be good, except that the Atewa Range has a significant number of species that may not be found

elsewhere in Ghana, as well as two endemic butterflies (which may be proxies for another 1,600 endemic organisms). However, as will be discussed later, the extent and positioning of the protected areas in the forest zone may not be optimal.

3.3.2 Coverage of the endemic species west of the Dahomey Gap

The previous section discussed the overall coverage of butterflies by the protected areas system. While it is important to protect overall biodiversity, this includes a large number of species that are widely distributed and common throughout appropriate ecological zones in Africa. The extent to which endemic species, those with limited geographical distributions, are covered by the protected areas system has a special importance.

Table 3.3.2 lists those species found in Ghana that are endemic to the area west of the Dahomey Gap (the broad band of savannah separating the Ghana forests from those of Nigeria). The western forest block from the Basse Casamance in Senegal to the Ghana/Togo Mountains has about 125 endemic species. They fall in three main groups: 1) Those species that are widespread from Senegal, Guinea, or Sierra Leone to Ghana or the Volta/Togo Mountains, 2) those species that are limited to the Liberia subregion, stretching from Sierra Leone to just before Abidjan in Côte d'Ivoire, and 3) those that are found in the Ghana subregion, stretching from Abidjan to Ghana or the Volta/Togo Mountains.

The origins of the two subregions lie in the repeated isolation of the forest zone during dry spells that have occurred repeatedly since the late Miocene and Pliocene. The Ghana subregion was centered on forest refuges in what now constitutes southeastern Côte d'Ivoire and southwestern Ghana – especially the Assinie/Grand Bassam and the Ankasa areas. It is often suggested that these were particularly important during the Pleistocene, but the differentiation in flora and fauna is too large to support such a short time frame (a fact underlined by recent DNA studies of various groups). The Liberia subregion species are by definition absent from Ghana, though four species listed as West African endemics might be considered expansive Liberian elements (see table 3.3.2.).

There have also been a number of small isolated refuges in West Africa, within Ghana especially the Volta/Togo Mountains and the Atewa Range. These must have remained forested during dry periods when they were entirely cut off from other forests by large stretches of savannah. In the Liberia subregion this was the case also of Guinea's Fouta Djalon and the Nimba Mountains. In all these cases altitude and topography must have produced a climate different from the surrounding lowlands – as indeed remains the case even today.

Ghana has 100 West African endemics as follows:

- Endemics to West Africa as a whole 67 species
- Endemics to the Ghana subregion 26 species
- Endemics to the Ghana/Togo mountains 7 species
- TOTAL 100 species

Thus, about 11% of the 925 Ghana butterflies are endemic, though in one way this underestimates the true level of endemicity, which as far as Ghana is concerned is mostly limited to the 800 forest butterflies. Using the proportion discussed earlier, the 100 endemic

butterflies may be a proxy for 80,000 West African endemics, if it is assumed that endemicity levels in other groups have the same levels of magnitude.

Of the 100 endemics, 64 have been positively recorded within the protected areas system (i.e. 64% of all endemic species). This proportion is significantly lower than the 81% of all species that are found within the system. There are a number of reasons for this. Ten endemic species are so far known only from the Atewa Range and might well in Ghana be limited to this area (and perhaps also Tano Ofin) (a further strong argument for increased protection of the Atewa Range). Five of the seven endemics of the Volta Region are known only from the central mountains and may not occur in any of the Volta protected areas, with the tiny Wli Falls/Agumatsa being the only such site in the richest forest habitats of the Volta Region. Kyabobo is too far north, and Kalakpa has too long a dry season). However, many of the endemic species are distinctly rare and more will eventually turn up inside the protected areas system.

Table 3.3.2. Species that are endemic to Africa west of the Dahomey Gap and their presence or absence from the protected areas system (GWD).

WA end = species occurring in both Liberia and Ghana subregions
Gha end = species limited to Ghana subregion (eastern CI to Ghana or Volta)
Vol end = species that are endemic to the Volta Region and Togo Mountains
GWD – indicates whether (yes) or not (no) a species has been found within the protected areas system

Species number	and name	Endemic	GWD	Comments for Ghana
7	Papilio horribilis	WA end	yes	only wettest forests – not Volta
17	Graphium nobicea	Vol end	yes	Volta endemic – Wli and Kyabobo
28	Graphium rileyi	Gha end	no	so far only known from Atewa
100	Mylothris dimidiata	WA end	yes	most wetter forests – not Volta
106	Mylothris poppea	WA end	yes	most forests except very dry
107	Mylothris spica	Gha end	yes	some wetter forests – not Volta
112	Mylothris atewa	Gha end	no	only known from Atewa
144	Pentila petreoides	WA end	no	only known from Atewa
153	Pentila abraxas	WA end	no	only a few old records
155	Pentila phidia	Gha end	yes	in most forests
160	Telipna semirufa	WA end	yes	all wetter forests – not Volta
161	Telipna maesseni	Vol end	yes	Volta endemic – Wli, Ho, etc
173	Ornipholidotos issia	WA end	no	only known from Atewa
174	Ornipholidotos tiassale	WA end	yes	all wetter forests – not Volta
181	Mimacraea darwinia	WA end	yes	all wetter forests – not Volta
185	Mimeresia moyambina	WA end	no	only known from Atewa
187	Mimeresia semirufa	WA end	yes	all wetter forests – not Volta
191	Mimeresia issia	Gha end	yes	all wetter forests – not Volta
195	Eresiomera jacksoni	Gha end	no	a record from Aburi
197	Eresiomera petersi	WA end	yes	all wetter forests – not Volta
217	Liptena griveaudi	Gha end	no	only known from Atewa
222	Liptena tiassale	Gha end	no	only known from Aburi
239	Liptena seyboui	Gha end	no	only known from Tano Ofin
242	Liptena helena	WA end	yes	all wetter forests – not Volta
249	Falcuna leonensis	WA end	yes	all wetter forests – not Volta
255	Tetrarhanis baralingam	WA end	yes	all wetter forests – not Volta
265	Larinopoda eurema	WA end	yes	most forests – not Volta
275	Micropentila mamfe	Gha end	no	only from a lost forest at Mamfe
306	Cephetola maesseni	Vol end	no	Volta endemic – Likpe area

307	Cephetola collinsi	Gha end	no	regular at Aburi
326	Stempfferia dorothea	WA end	yes	only at Wli Falls with certainty
330	Stempfferia leonina	WA end	yes	forest – except very dry
344	Stempfferia staudingeri	WA end	no	only known from Atewa
372	Spindasis iza	WA end	no	all wetter forests – not Volta
386	Pseudaletis subangulata	WA end	no	one old record – no data
395	Iolaus carolinae	Gha end	no	only one female from Cape Coast
404	Iolaus mane	WA end	no	only one male from Atewa
405	Iolaus theodori	Vol end	no	Volta endemic - Likpe
406	Iolaus likpe	Vol end	no	Volta endemic – Likpe
418	Iolaus banco	Gha end	no	Côte d'Ivoire, once from Ghana
447	Hypolycaena clenchi	WA end	yes	all wetter forests – not Volta
477	Pilodeudorix aurivilliusi	WA end	no	all wetter forests – not Volta
506	Capys vorgasi	Vol end	no	Volta endemic – Likpe area
530	Anthene atewa	Gha end	no	all wetter forests – not Volta
532	Anthene radiata	WA end	no	only known once from Takoradi
538	Anthene helpsi	Gha end	no	only known from Atewa
560	Cupidesthes jacksoni	Gha end	yes	all wetter forests – not Volta
564	Cupidesthes pungusei	Gha end	yes	only known from Kakum types
611	Lepidochrysops synchrematiza	WA end	no	mostly Volta – drier forests
623	Oboronia liberiana	WA end	yes	most wetter forests – not Volta
673	Bicyclus zinebi	WA end	yes	all forests – not Volta
683	Bicyclus maesseni	WA end	yes	some wetter forests
700	Bicyclus abnormis	WA end	yes	all wetter forests – not Volta
704	Bicyclus dekeyseri	WA end	yes	all wetter forests – not Volta
712	Hallelesis halyma	WA end	yes	all wetter forests – not Volta
713	Henotesia elisi	WA end	yes	dry hills in transition zone – mainly
718	Ypthima vuattouxi	Gha end	yes	forest-savannah transition
762	Charaxes petersi	WA end	no	Tano Ofin – distribution uncertain
769	Charaxes plantroui	WA end	yes	Boabeng-Fiema and Atewa - ?Volta
809	Protogoniomorpha cytora	WA end	yes	all forests – not Volta
818	Junonia hadrope	Vol end	no	Volta endemic – Ho, Akosombo
858	Cymothoe aubergeri	WA end	yes	only Kakum
873	Cymothoe mabillei	WA end	yes	all wetter forests – not Volta
889	Pseudacraea hostilia	WA end	yes	some wetter forests – not Volta
961	Euriphene veronica*	WA end	yes	only to Ankasa and Draw River
968	Euriphene simplex	WA end	yes	all wetter forests – not Volta
988	Euriphene leonis*	WA end	no	Cape Three Points & one old male
996	Bebearia osyris	WA end	yes	all wetter forests – not Volta
1017	Bebearia arcadius	WA end	yes	all wetter forests – not Volta
1035	Bebearia ashantina	Gha end	yes	all wetter forests – not Volta
1047	Euphaedra gausape	WA end	yes	all wetter forests – not Volta
1047	Euphaedra mariaechristinae	Gha end	yes	some wetter forests – not Volta
1061	Euphaedra crockeri	WA end	yes	all wetter forests – not Volta
1062	Euphaedra eusemoides	WA end	no	only known from Atewa
1067	Euphaedra laboureana	WA end	yes	some wetter forests – not Volta
1071	Euphaedra minuta	WA end	yes	some wetter forests – not Volta
1072	Euphaedra modesta	WA end	yes	some wetter forests – not Volta
1078	Euphaedra vetusta	WA end	yes	only Kakum so far
1079	Euphaedra aberrans	WA end	no	just a few old Ghana records
1085	Euphaedra phaethusa	WA end	yes	all forests except very dry
1086	Euphaedra inanum	WA end	yes	all wetter forests – not Volta
1096	Euphaedra ignota	Gha end	yes	all wetter forests – not Volta
1106	Euphaedra francina	WA end	yes	all wetter forests – not Volta
1112	Euphaedra zampa	WA end	yes	all wetter forests – not Volta
1117	Euphaedra perseis	WA end	yes	all wetter forests – not Volta
1119	Euphaedra eupalus	WA end	yes	all wetter forests – not Volta
1123	Pseudathyma dorothea*	WA end	yes	only to Ankasa
1189	Acraea macaria	WA end	yes	some wetter forests – not Volta
1210	Pyrrhiades lucagus	WA end	yes	only southern outliers and Gambaga

1217	Celaenorrhinus sagamase	Gha end	yes	only Kakum and Atewa – not Volta
1219	Celaenorrhinus leona	WA end	no	only Atewa and Cape Three Points
1223	Celaenorrhinus ankasa	Gha end	yes	all wetter forests – not Volta
1263	Abantis tanobia	Gha end	yes	all wetter forests – not Volta
1276	Astictopterus anomoeus	WA end	no	common on Atewa, few elsewhere
1305	Ceratrichia crowleyi*	WA end	yes	only known from Ankasa
1308	Ceratrichia maesseni	Gha end	yes	all wetter forests – not Volta
1337	Paracleros placidus	WA end	yes	all wetter forests
1344	Paracleros bala	Gha end	yes	some wetter forests
1426	Melphina maximiliani	WA end	no	only known near Cape Coast
1435	Platylesches rossi	WA end	no	from Volta only – must be in Ghana
TOTAL	100 species			

* species essentially of the Liberia subregion, only just reaching western Ghana (Ankasa, Cape 3 Points)

3.3.3 Specific comments on the Ghana subregion endemics

Of the 100 species endemic to Africa west of the Dahomey Gap, 33 are strictly limited to the Ghana Subregion, including the somewhat special fauna of the Volta Region. Of these 17 (52%) are known from within the protected areas system and 16 (48%) are not. This is again partly because the Atewa Range has two narrowly endemic species and a number of rare endemics that may not be found elsewhere in Ghana. The list also includes a number of species only found in unusual habitats, such as the Aburi Botanical Gardens or elsewhere. These are species that inside other forests might only be found in small colonies in a few specialized habitats and therefore less likely to have been discovered. Probably another 6-8 additional species will eventually be found, taking the total in the protected areas system to 60-70% of all West African endemics.

Table 3.3.3 gives a quick annotated overview of the 33 endemics of the Ghana Subregion. More detail on each of them can be found in Larsen (2005).

Table 3.3.3. An annotated list of the butterflies endemic to the Ghana Subregion of West Africa (Ghana, eastern Côte d'Ivoire, and the Volta Region).

= within the protected areas system
~ = not within the protected areas system

 # Graphium nobicea Suffert, 1904 – the species is endemic to the Volta Region (*P. maesseni* Hecq is a junior synonym), often common, and known from Wli Falls and Kyabobo.
~ Graphium rileyi Berger, 1950 – the species is a Ghana Subregion endemic known from the Atewa Range in Ghana and from a few localities in Côte d'Ivoire.
 # Mylothris spica Möschler, 1884 – the species is a Ghana Subregion endemic known from Kakum, Bia, Owabi, and used to occur at Aburi.
~ Mylothris atewa Berger, 1980 – the species is endemic to the Atewa Range forests, where often common. It might occur in Tano Ofin. It is an outstanding example of endemicity – a very distinct species on a single tiny ridge of hills.
 # Pentila phidia Hewitson, 1884 – the species is a Ghana Subregion endemic, unusually also found in the Volta Region and some localities in Côte d'Ivoire. It is widely distributed and known from Kakum, Bia, and Kyabobo.

 # Telipna maesseni Stempffer, 1970 – the species is a Volta Region endemic, common at Wli Falls and known from Kyabobo. Records from elsewhere in Ghana seem unlikely.
 # Mimeresia issia Stempffer, 1969 – the species is rare, but widely distributed, Ghana Subregion endemic, described from Côte d'Ivoire but known from Kakum, Ankasa, and the Atewa Range.
~ Eresiomera jacksoni Stempffer, 1969 – the species is a very rare Ghana Subregion endemic, described from Côte d'Ivoire but also recorded from the Aburi Scarp near the conference centre. The large *Ceiba*-tree on which it was caught still stands at the edge of the road, but there is no forest nearby.
~ Liptena griveaudi Stempffer, 1969 – the species is a very rare Ghana Subregion endemic, described from Côte d'Ivoire, that was recently caught on the Atewa Range.
~ Liptena tiassale Stempffer, 1969 – the species is a Ghana Subregion endemic, described from Côte d'Ivoire; in Ghana known only from the Aburi Botanical Gardens, where sometimes numerous.
 # Liptena seyboui Larsen & Warren-Gash, 2001 – the species is a Ghana Subregion endemic, known from Alépé in eastern Côte d'Ivoire and from Bia in Ghana.
~ Micropentila mamfe Larsen, 1986 – the species is a Ghana Subregion endemic, known only from the type collected by the author near Mamfe, but also with a record from Côte d'Ivoire.
~ Cephetola maesseni Libert, 1999 – the species is a Volta Region endemic, described from the Likpe area and possibly occurring at Wli Falls.
~ Cephetola collinsi Libert & Larsen, 1999 – the species is a Ghana Subregion endemic, regularly found at Aburi (the distribution of three very similar species in the *C. sublustris*-complex is not well known).
~ Iolaus carolinae Collins & Larsen, 2000 – the species is a Ghana Subregion endemic, known only from the types, from Béréby in Côte d'Ivoire and a paratype from Cape Coast.
~ Iolaus theodori Stempffer, 1970 – the species is a Volta Region endemic, known from the Likpe area, Ho, and Kpalimé in Togo. It may well occur at Wli Falls.
~ Iolaus likpe Collins & Larsen, 2004 – the species is a Volta Region endemic, known only from the holotype from Likpe. It may well occur at Wli Falls.
~ Iolaus banco Stempffer, 1966 – the species was described from Côte d'Ivoire and has subsequently be found in many localities, including one male from Cape Three Points.
~ Capys vorgasi Collins & Larsen, 2004 – the species is a Volta Region endemic, collected only near Likpe. The host-plant does not seem to be present at Wli Falls.
~ Anthene atewa Larsen & Collins, 1998 – the species is a Ghana Subregion endemic, with record from the Atewa Range and Hotopo, as well as from near Abidjan in Côte d'Ivoire.
~ Anthene helpsi Larsen, 1994 is very special and was described from the Atewa Range, where it has been collected three times in the same small area. A single specimen from Côte d'Ivoire is probably mislabelled and the species is almost certainly an Atewa endemic.
 # Cupidesthes jacksoni Stempffer, 1969 – the species is a Ghana Subregion endemic that is scarce in eastern Côte d'Ivoire and Ghana's forest zone. It has been found in Kakum, Ankasa, and Bia.
 # Cupidesthes pungusei Collins & Larsen, 2005 – the species is a Ghana endemic known from Kakum National Park, but it is possible that specimens from Sierra Leone and Cameroun also belong to this species.
 # Ypthima vuattouxi Kielland, 1985 – the species was a Ghana Subregion endemic but appears now also to have been found in the Gambia and Senegal. It has been found in several of the savannah National Parks.
~ Junonia hadrope Doubleday, 1847 – the species is a most distinctive Volta Region endemic, which is likely to be found at Wli Falls.

#Bebearia ashantina Dudgeon, 1913 – the species is a Ghana Subregion endemic, found very sparingly in Ghana and Côte d'Ivoire.
 # Euphaedra mariaechristinae Hecq & Joly, 2003 – the species is a Ghana Subregion endemic described from Atewa, but also found in Kakum and Ankasa.
 # Euphaedra ignota Hecq, 1996 – the species is a Ghana Subregion endemic, described from the Atewa Range, but also known from Kakum and some forest reserves.
 # Celaenorrhinus sagamase Collins & Larsen, 2005 – the species is a Ghana endemic, described from the Atewa Range, but also known from Kakum.
 # Celaenorrhinus ankasa Collins & Larsen, 2005 – the species is a rare Ghana endemic, known from Ankasa, the Atewa Range, and recently in Bobiri.
 # Abantis tanobia Collins & Larsen, 2005 – the species is a very rare Ghana endemic, known from Bia and Tano Ofin.
 # Ceratrichia maesseni Miller, 1971 – the species is a Ghana Subregion endemic, widely distributed in forest (Kakum, Ankasa, Bia) and recorded a few times from Côte d'Ivoire.
 # Paracleros bala sp. nov. – the species is a Ghana Subregion endemic, known from the Volta Region as well as from Kakum.

3.3.4 Coverage of butterflies by the protected areas system in different ecological zones

Following the conclusion that the present protected areas system – with the addition of the Atewa Range – covers the known butterflies of Ghana quite well, some details concerning the forest zone, the Volta Region, and the savannah areas will be examined.

3.3.4.a Forest zone (excluding Volta Region)

It was earlier mentioned that even forest species showed different ecological preferences and that all of them could not be expected to be present in each and every forest. Reserving the Volta Region for separate treatment, we find that the forest zone contains three main forests within the protected areas system: Ankasa National Park (490 km^2), Bia National Park (300 km^2), and Kakum National Park (607km^2). The two remaining parks (Owabi and Boabeng-Fiema) are both tiny and contain only a few species not yet found elsewhere. The total forest area in the current protected areas system is about 1,400 km^2, which is 1% of the original forest cover, 2% of the cover a century ago, and about 10% of the total remaining closed forest in Ghana.

So far 590 species have been found in these three forests (table 3.3.4), or 75% of all 780 forest butterflies west of the Volta River. It is interesting to note that of these 590 species, only 266 (45%) have yet been found in all three forests; 156 (26%) species have only been found in only one of the three. Though more species will be found in each of these forests, this clearly indicates that each of them plays a genuinely unique role in conserving the fauna and flora.

If the Atewa Range were added to the protected areas system, the total number of species would rise to 680, or 87% of the780 forest species from west of the Volta River. Given that more species remain to be recorded, the addition of Atewa would bring almost total coverage of forest butterflies.

Table 3.3.4. Butterfly numbers positively recorded from Ankasa, Bia, and Kakum National Parks and the Atewa Range.

Category	Number of species
Found in three main forest NPs	266
Found in two main forest NPs	168
Found in one main forest NP	156
Total in the three main protected forests	**590**
Additional Atewa* forest species	90
Total Ankasa, Bia, Kakum, Atewa	**680**
Western forest species not yet in above areas	100
Total western forest species	**780**
Volta and savannah species	145
Total Ghana butterfly fauna	**925**

* the total number of species positively known from Atewa is 572

The three forests are well and strategically selected, or they would not cover the fauna to the extent that they do. They are also mainly of high quality, though about half of Bia is still in poor condition after a period of illegal logging during the 19770s and 1980s. However, there are some long-term potential weaknesses:

a) The protected area is very small: Just one or two percent of the original forest zone is included as part of the protected areas system. This would seem to be quite low by any standards, though it encompasses about ten percent of the remaining well-forested areas, most of which are classified as forest reserves. Some forest reserves are now classified as GSBAs, which is a desirable development. In principle it means that no more logging should be taking place, but the protection levels are variable and on average they are not under as firm control as the forests within the protected areas system – even if logging has stopped, poaching is generally rife. Though little is known about the minimum desirable size of individual protected forests, the author's impression is that Ankasa and Kakum are sufficiently large to conserve most of insect biodiversity. Bia North (73 km^2) is too small and it will take a very long time before regeneration of Bia South is anywhere near complete – if that ever happens. Whether the size is truly large enough for some mammal species, especially the elephant, is a moot point. It has been suggested on several occasions that the Draw River Forest Reserve be incorporated with Ankasa/Nini Suhien (e.g. McCulllough *et al*. (2005); the forest in contiguous with the National Park, has a shared elephant population, and is in good condition. The Prah-Suhien Forest Reserve is contiguous with Kakum National Park and could increase the size of the protected area (Prah Suhien has colonies of the wonderful *Pseudopontia paradoxa* Felder & Felder, 1869, the single member of a wholly Afrotropical subfamily that is rare in Ghana). It has also been suggested that the Krokosua Hills Forest Reserve should be linked to Bia; this reserve is some way from Bia and such linkage would be one of management rather than substance. The conservation value of Krokosua needs to be considered on its own merits (see section 4.2.7).

b) The distances between the three components are very long: The distances between Ankasa, Kakum, and Bia are relatively long. They are in fact situated almost at the extreme ends of the forest zone proper. Much of the existing forested area in between the three parks seems likely to disappear. Forest not under government management is almost destined to disappear: even long-established sacred groves are disappearing all over Ghana. Remaining riverine forest is being cut down. Even forest reserves under the Forestry Commission are not immune to severe degradation. One result of this has been that faunal interchange between forests within Ghana has become more difficult – and will increasingly be inhibited. One "large" example concerns the elephant. In the relatively recent past elephants from Kakum were still in actual or potential contact with populations in western Ghana and eastern Côte d'Ivoire. This contact has now been cut: the elephant population in Kakum is now physically and genetically isolated. Increasingly gene-flow between the major protected areas will be diminished and increasingly local extinction will not be followed by re-establishment from outside. The stepping-stones for such gene-flow are disappearing. It would seem prudent to add such stepping-stones inside the triangle composed by Ankasa, Bia, and Kakum through the inclusion of existing forest reserves in the protected areas system. Several forest reserves would suit this purpose, being in good condition with a high level of biodiversity, for instance Boi-Tano, Cape Three Points, and others that are not personally known to the author. Many of the "best" have already been designated as GSBAs that should in principle not be degraded, which is a welcome approach that was adopted before the Wildlife Division became part of the Forestry Division, but there is evidence that GSBA status does not necessarily confer strong protection status on the forests designated as such.

c) Upland evergreen forest: It has already been emphasized that the absence from the protected areas system of upland evergreen forest, effectively the Atewa Range and the higher levels of Tano Ofin Forest Reserve, is a serious omission. They have two endemic butterflies [a proxy for 1,600 other endemic organisms] and a number of endemic plants. They also have about 90 butterfly species not found within the forests of the protected areas system. Both have the status of GSBA, but logging appears to be continuing in both. Proper protection, especially of the Atewa Range, is undoubtedly one of the most important conservation priorities in Africa west of the Dahomey Gap (see also the discussion in section 4.2.2 on Atewa).

d) Southern and southeast outlier forests: This forest type is found on the southern and eastern side of the main forest zone, along the hills edging Lake Volta, on the Accra Plains, and along the coast west to Sekondi. They are low, dry forests growing in the rain-shadows of the coastal strip and the Dahomey Gap. They mostly exist as small sacred groves, often on hilltops, and are especially noticeable from the main road between Awutu, Winneba, and Mankessim. They are known to be botanically interesting, having a different structure from that of other forests in Ghana, and containing a number of endemic plants. Within the protected areas system they occur sparingly only in the Shai Hills; there might be patches in drier parts of Kalakpa. Little is known about the butterflies associated with this type of forest. It certainly allows some savannah species to extend along the coastal area and the West African endemic skipper, *Pyrrhiades lucagus* Cramer, 1777 , can be considered a character species for this vegetation (though the species occurs also in the north on the Gambaga Escarpment). A small patch of dense southern outlier forest is part of the forest reserve south of Kissi, 25 km west of Cape Coast, and south of the main road [this is not the formal Forestry Commission name of the forest]. This part of the forest contrasts strongly with the

western part that abuts the main road half a kilometre to the west. The butterflies of the outlier forest constitute a curious – unpredictable – mix of forest species. This is rather similar to the situation in the Shai Hills where the forest fragments supports many forest butterflies found nowhere else in the reserve. At Kissi the author found many specimens of *Melphina maximiliani* Belcastro & Larsen, 2005, which was otherwise known only from relatively dry habitats in Sierra Leone and Côte d'Ivoire though its genus is generally one of true rainforest. It is understood that many of the small forests of this nature are listed as GSBAs; their conservation would seem urgent since they are much used for gathering firewood and prone to fire damage.

3.3.4.b Volta Region

Protected areas in Volta Region:
The ecological zonation of the Volta Region in Ghana and Togo differs from that described for Ghana and West Africa earlier in the report. The coastal areas up to the Ghana/Togo Mountains are effectively a savannah extension of the Dahomey Gap, which turns west along the Accra Plains in a rain-shadow. In this rain-shadow lies Kalakpa Resource Reserve (320 km^2), which at its northern end has significant expanses of riverine forest along depressions with streams that are so small as to be almost invisible. However, most of the National Park is quite typical of Guinea savannah.

Just north of the park in the Ho area begins the ridge of the Ghana/Togo Mountains, with peaks that rise to 800m and continue north to the Hohoe/Jasikan area. The original vegetation of these mountains was well-developed semi-deciduous forest with strong affinities to those of Ghana proper. Both to the east and to the west these mountains are surrounded by savannah since rainfall at lower levels is both less and more seasonal than in the mountains. Human activities have strongly diminished the forest area and severely degraded what is left. The only protected area is the tiny Wli Falls/Agumatsa Nature Sanctuary ($3km^2$). From the 1950s to the 1970s Father Maessen was resident in Ho, Kpandu, but mostly in Likpe-Mate and collected assiduously in the forested areas of the mountains, which at the time were much more extensive than they are today. Though Maessen did visit Wli Falls from time to time, it does not seem to have been high on his list of priorities: he must have had many small forests of equal or higher quality. The author's own attempts at finding good collecting localities in the main Ghana/Togo Mountains never met with success (see also the report on Kyabobo and Volta Region (Larsen 2006).

In principle forest should stop occurring much north of Hohoe, were it not for the fact that another ridge of mountains running north-south begins, much of which is now subsumed in the Kyabobo National Park ($218km^2$). This mountain ridge is again surrounded on all sides by open formations, mainly fairly typical Guinea savannah. The mountains themselves from a distance look as if they are densely clad in forest. Much of it is actually dense savannah woodland but also significant areas of dry *Anogeissus* forest. In favoured localities, usually in depressions with abundant water or where there is shade for parts of day, semi-deciduous forest may develop. The valley running through Shiare village (just outside the present park boundaries in the south) is one example that the author sampled in some detail. The Laboum Waterfall area is another. At Pawa Satellite Camp the west-facing slopes next to the camp on the other side of the river is close to real forest – and found to be rich in forest birds by Dowsett-Lemaire & Dowsett (2005). There must be many such localities dotted around the mountain range, some possibly even better than the ones mentioned. However, even well

developed forest in Kyabobo is somewhat impoverished compared with further south in the main Ghana/Togo Mountains.

The Volta Region butterfly fauna:
As discussed in the companion report specifically on Kyabobo National Park and the Volta Region (Larsen 2006), the Volta Region has a special biogeographical history and faunal composition. The Volta Region is bounded to the west by the Volta River (now the Volta Lake) and covers the Ghana/Togo Mountains, which then along their eastern edge merge with the Dahomey Gap, the dry savannah wedge that the divides the main forest block into two. The Gap itself is a major biogeographical feature that currently makes faunal interchange between the forests of Nigeria and those west of the Gap well nigh impossible. The salient features of the Volta Region butterflies are:

a) The Volta Region has 7 butterflies that are narrowly endemic to the Ghana/Togo Mountains. They are included with annotations in table 3.3.3 on endemics. Only the two first have been collected within the protected areas system, both in Wli Falls and Kyabobo. The species are:

Papilio nobicea Suffert, 1904 (TL "Togo")
Telipna maesseni Stempffer, 1970 (TL Likpe)
Cephetola maesseni Libert, 1999 (TL Likpe)
Iolaus theodori Stempffer, 1970 (TL Likpe)
Iolaus likpe Collins & Larsen, 2004 (TL Likpe)
Capys vorgasi Collins & Larsen, 2004 (TL Likpe)
Junonia hadrope Doubleday, 1847 (TL "West Africa")
(an annotated version of the list is found in the Volta/Kyabobo report, table 3.3.2a (Larsen 2006)).

b) In addition 15 species are found in the Ghana/Togo Mountains and then extend further east to Nigeria, to Cameroun, or to the main equatorial forests. These species do not cross the Volta River into Ghana proper, signifying that the river has served as a genuine biogeographical boundary a various periods, even while faunal interchange between Nigeria and the Volta Region was possible. Only half of these species are found within the protected areas system. The species in question are:

Aslauga ernesti Karsch, 1995 (TL Misahöhe)
Aslauga imitans Libert, 1994 (TL Amedzofe)
Mimacraea maesseni Libert, 2000 (TL Volta Region)
Liptena pearmani Stempffer, Bennett & May, 1974 (TL Ubiaja, Benin)
Larinopoda aspidos Druce, 1890 (TL Lagos)
Iridana hypocala Eltringham, 1929 TL Uganda, Jinja)
Spindasis crustaria Holland, 1890
Iolaus parasilanus maesseni Stempffer & Bennett, 1958
Oboronia pseudopunctatus Strand, 1912 (TL Cameroun)
Bicyclus italus Hewitson, 1865 (TL Old Calabar)
Bicyclus sylvicolus Condamin, 1865 (TL Cameroun)
Neptis angusta Overlaet, 1855 (TL Sankuru, Democratic Republic of Congo)
Euphaedra ruspina Hewitson, 1865 (TL Old Calabar)
Acraea eugenia Karsch, 1893 (TL near Bismarckburg)
(an annotated version of this list is in the Volta report, table 3.3.3 (Larsen 2006)).

c) Of the 925 butterflies recorded from all of Ghana only 641 (70%) are found in the Volta Region. The bulk of those "missing" are 150 species of the wetter forests that are found on both sides of the Dahomey Gap – common species that can be found at Kakum and near Lagos, but not in the Volta Region. The species in question are mainly those that are centered on the wet and moist evergreen forests, with relatively little capacity for surviving forest degradation (108 are classified as WEF (wet evergreen forest), 32 as MEF (moist evergreen forest, and just 10 in other categories). Most of these may have been present in the Volta/Togo Mountains during periods when conditions were moister than they are today, and subsequently become locally extinct. The species that are missing from the Volta Region, but found both in the forests of Ghana and those of Nigeria and further east, are marked 2x2 in appendix 1 and discussed in section 3.3.1 of the Volta/Kyabobo report (Larsen 2006).

d) Of the 100 species that are endemic to Africa west of the Dahomey Gap, 7 are the strict Volta endemics already referred in a). Of the remaining 93 no less than 76 are missing, which means that only 17 western endemics have managed to cross the Volta River and survive there to the present day (for details see the report on Volta Region/Kyabobo (Larsen 2006), especially table 3.3.2b).

Assessment of the protected areas system in the Volta Region: Generally speaking the coverage of butterfly biodiversity in the Volta Region is less than for rest of Ghana. Out of the 641 species known 474 have been recorded from within the protected areas system: this is 74% of the total, compared to 80% for all forest species in Ghana. Of the 7 species endemic to the Volta Region, only two are known from within the system (29%). Of the 15 species that do not cross the Volta River but extend east to Nigeria or beyond, only 7 are found within the system (47%). The reason for this is quite simple. The missing species are mainly those of moister semi-deciduous forest in good condition. Such forests are only found in the central mountain sector and the only protected area is the tiny Wli Falls Nature Sanctuary. Kalakpa plays an excellent role in conserving savannah biodiversity and with the Shai Hills is one of two that are actually in the Dahomey Gap; it also preserves a large area of forest-savannah transition. Kyabobo is quite rich, even in forest butterflies, but those most adapted to the wetter forests are largely absent. It would be desirable to have more semi-deciduous forest in good condition under conservations status. At the Conservation priority-setting workshop for West Africa in December 1999 organized by Conservation International (Bakarr et al. 2001), there was much support for improving protection of the area. Whether there are significant tracts left in this densely populated area is uncertain. But the figures indicate as a minimum the desirability of stitching together a network of interconnected sites on both the Ghana and the Togo side of the central mountains.

3.3.4.c Savannah zone

The savannah zone in Ghana covers two-thirds of the northern part of the country, most of it in the form of classic Guinea Savannah. Only in the extreme northeast can traces of Sudan Savannah be found. The protected areas system has a wide coverage in the Guinea Savannah. The two largest parks are Mole (4,840 km^2) and Digya (3,478 km^2). In addition there are Kalakpa (320 km^2), Kogyae (388 km^2), Bomfobiri (53 km^2), Bui (1,821 km^2), Gbele (565 km^2), and Shai Hills (49 km^2). Thus, the total area of the savannah in the protected areas system is more than 11,000 km^2, or about eight times larger than the area of forest.

Data on the butterflies of the savannah zone are found in the remaining paragraphs of this section, but a summary is given in table 3.3.5 below:

Table 3.3.5. A summary of the number of butterfly species in the savannah zones of Ghana and the percentages of the Ghana total of 925 species.

Ecological categories	Species	% of Ghana
Species centered on the Guinea Savannah*	83	9%
Species centered on the Sudan Savannah	48	5%
Specials of special habits of wide distribution	4	>%
SUB-TOTAL: Specialized savannah butterflies	**135**	**14%**
Species ubiquitous to Ghana, which are generally of savannah origin	33	4%
SUB-TOTAL: General savannah residents	**168**	**18%**
Forest butterflies penetrating along riverine vegetation in an unpredictable manner	121	13%
TOTAL: All Ghana savannah records	**289**	**31%**
TOTAL GHANA BUTTERFLIES	**925**	**100%**

* including *Pyrrhiades lucagus*

Thus the savannah butterfly fauna as strictly defined amounts to 135 species, or 14% of the Ghana total of 925. When 33 ubiquitous species are added, the total rises to 168, or 18% of the Ghana total. So far a total 121 forest butterflies have been recorded from the savannah localities of the protected areas system: a few of these are species with considerable capacity for extending north of their normal habitats, but the bulk of these are limited to riverine vegetation and are of an opportunistic nature. The forest elements bring the total species recorded from savannah areas to 31%. The total will rise: from time to time other forest butterflies will “blunder” into the savannah.

i) The forest-savannah transition: The savannah begins with a transition woodland zone that is usually narrow to almost absent, but which may involve the intrusion of riverine forest far north along major river systems. Riverine forest is usually not wide, consisting of just a few metres along the river banks. In some localities riverine forests are more extensive, within the protected areas system especially in Kalakpa, Bui, and the southern part of Digya. Little is known and almost nothing published about the butterflies of the transition zone and riverine vegetation in West Africa. Larsen & Mei (1998) describe the situation in the Parc National du Haut Niger in Guinea, where a few real surprises occurred.

Riverine forest in Ghana is best developed in Kalakpa, Bui, and the southern half of Digya [not visited on the current mission] where the forests may be quite wide, up to 500m or more. Table 3.3.6 illustrates the number of forest species in the eight savannah localities within the

protected areas system. The details are listed in appendix 2. In all the localities these species were effectively limited to riverine vegetation.

Table 3.3.6 Forest species recorded in savannah localities (all localities yielded 121 forest species (see appendix 2 for details).

Locality	Forest species	Locality	Forest species
Kalakpa	75	Kogyae	26
Bui	45	Mole	13
Bomfobiri	33	Digya	12
Shai Hills	31	Gbele	4

In total, 121 forest species have been recorded in the savannah areas, which means than many of them were found in a single locality only. This constitutes just 14% of the 800 or so of all forest butterflies in Ghana. Using the classifications of habitat choice that were developed by Larsen (1994), 82 of the 108 species fall in the categories of "all-forest habitats (ALF)" (81) and "dry-forest habitats (DRF)" (14). A further 23 fell in the "moist forest habitats (MEF)" category and 3 in the "west forest category (WEF)": some of these will need reclassification as ALF and DRF on the basis of the present mission.

By far the largest number of forest species, no less than 75, was found in Kalakpa (table 3.3.6). The reasons for this are clear: the riverine vegetation is extensive, is more diverse than in the other parks, and the park is very close to the true forest vegetation of the mountains from Ho northwards. A number of species were rather surprising since they are normally associated with true forest habitats: *Papilio menestheus* Drury, 1773, *Graphium liponesco* Suffert, 1904, *Pentila picena* Hewitson, 1874, *Larinopoda aspidos* Druce, 1890, *Oxylides faunas* Drury, 1773, *Ariadne albifascia* Joicey & Talbot, 1921, *Catuna angustatum* Felder & Felder, 1867, *Euphaedra phaetusa* Butler, 1866, *Acraea umbra* Drury, 1782, *Gorgyra mocquerysii* Holland, 1896, *G. diversata* Evans 1937, *G. subfacatus* Mabille, 1889, and *Pteroteinon laufella* Hewitson, 1868. None of these was caught in other savannah localities. Dowsett-Lemaire & Dowsett (2005) also express surprise at the large numbers of forest birds.

Though the number of forest butterflies found in Bui is probably underestimated [access is almost impossible during the wet season], with 45 it certainly falls well short of Kalakpa. The main reason is probably that true forests are quite far from Bui compared with Kalakpa. Some species were surprising and not recorded from other savannah localities: *Mylothris schumanni* Suffert, 1904, *Junonia stygia* Aurivillius, 1894, *Neptis metella* Doubleday, 1848, *N. trigonophora melicertula* Strand, 1912, *Euphaedra edwardsii* van der Hoeven, 1845, *Coeliades chalybe* Westwood, 1852.

The relatively high figure of 33 for Bomfobiri is a result of the aftermath of the catastrophic fires of 1983 that reduced what was once a genuine savannah/forest mosaic to impoverished

savannah, thus giving it – in effect – the worst of both worlds: *Triclema lamias* Hewitson, 1878, *Libythea labdaca* Westwood, 1851, *Protogoniomorpha cytora* Doubleday, 1847, *Acraea circeis* Drury, 1782, *Eagris denuba* Plötz, 1879, and *Osmodes thora* Plötz, 1884 were not found in other savannah localities.

Kogyae has 26 forest butterflies and the situation is somewhat similar to that of Bomfobiri, though the habitat was not as strongly altered during the fires of 1983.

The Shai Hills is a very special, dry habitat, yet with as many as 31 forest butterflies, all of them allied to the southeast outlier forests, rather than to riverine vegetation. Among the species are some that have not been found in other savannah locations: *Graphium policenes* Cramer, 1775, *Mylothris poppea* Cramer, 1777, *Iolaus iasis* Hewitson, 1865, *Amauris tartarea* Mabille, 1876, *Charaxes numenes* Hewitson, 1859, *C. cedreatis* Hewitson, 1874, *Euxanthe eurinome* Cramer, 1775, and *Acraea orestia* Hewitson, 1874.

Further to the north, Mole has 13 forest species, all of them found elsewhere. The presence of *Euphaedra cyparissa* Cramer, 1775 and *E. janetta* Butler, 1871 so far north is truly surprising. Few additional forest butterflies will be found in Mole.

Digya (North) yielded 12 forest species, all of them found elsewhere. They may actually be the survivors of a larger assemblage from before the Akosombo Dam flooded the Volta River. Even in the northern parts of the park the remains of now submerged riverine forests can still be seen, forty years later (see fig. 4.1.6). Digya (South), however, apparently still has considerable amounts of riverine vegetation left, and it is hoped to do a comparative study of the two parts of the park over the next couple of years (see section 4.1.6).

Gbele yielded just 4 forest species in the form of *Bicyclus vulgaris* Butler, 1868, *B. funebris* Guérin-Méneville, 1844, *Y. antennata cornesi* Kielland, 1982, and *Tagiades flesus* Fabricius, 1781 (which was recorded in four other savannah localities).

Finally, for the record, no trace of true forest butterflies was found on the Gambaga Escarpment.

ii) The Guinea Savannah: Most of the Guinea savannah is constituted by tall-grass savannah with a varying degree of trees, the density of trees broadly speaking decreasing from to north. When trees are dense they form woodland savannah, where the canopy may cover much of the ground but it is never fully closed as in forest proper. The species composition of the trees is very different from forest and because the canopy is not closed, the ground is covered with grass. Occasionally areas with low grass are found, often in conjunction with rocks or swamps, and the species-composition in such places may be different from the usual one.

The butterflies that are centered on the Guinea Savannah are listed in appendix 3. The total number of species that may be classified as Guinea Savannah elements is 83. Of these, 74 are present within the protected areas system. That is 89% of the total, the remainder being rare or very rare species that may be dependent on small, local specialized habitat types within the general savannah zone. Thus, the savannah fauna is proportionately better represented within the protected areas system than any of the other faunal elements, even though collecting has not been all that intensive.

To this should be added the four widespread species of specialized habitats that ultimately were savannah species and the 33 ubiquitous species discussed in section 3.3.4.d. The ubiquitous species are all common and are often among the most noticeable butterflies in the savannah areas. The total number of species integral to and widespread in the Guinea Savannah is thus 120. All the localities also have a number of Sudan Savannah species and a number of forest butterflies, so the estimated totals in various localities range from 127 in Gbele to 227 in Kalakpa (Table 3.3.7).

Table 3.3.7. Species recorded and the estimated total butterfly fauna in the Guinea Savannah localities*.

Locality	Recorded species	Estimated totals
Bomfobiri	60	144
Bui	95	215
Digya	60	189
Gbele	62	127
Kalakpa	127	227
Kogyae	88	163
Mole	84	149
Shai Hills	89	139

* see the locality accounts in chapter 4

Among the characteristic butterflies is – appropriately, as it happens – the guineafowl *Hamanumida daedalus* Fabricius, 1775. The pattern of the butterfly is uncannily like that of the bird of the same name, and even the genus name from 1819 is a paraphrase of that of the bird (*Numida meleagris*) (fig. 3.34.1). The most dramatic and beautiful butterflies in the Guinea Savannah are the three large *Charaxes*, *C. varanes vologeses* Mabille, 1876, *C. epijasius** Reiche, 1850 and *C. achaemenes atlantica* van Someren, 1970. They have the habit of perching on trees and then making rapid sorties in wide circles around the tree; the smaller *C. viola* Butler, 1866 is another savannah fixture. Among the most frequent butterflies met with are *Graphium angolanus baronis* Ungemach, 1932, *Eurema brigitta* Stoll, 1780, *Hypolycaena philippus* Fabricius 1793, *Tirumala petiverana* Doubleday, 1847, *Amauris damocles* Fabricius, 1793, *Bicyclus pavonis** Butler, 1876, *Bicyclus angulosa** Butler, 1868, *Ypthima condamini nigeriae* Kielland, 1982, *Precis octavia* Cramer, 1777, *Precis antilope* Feisthamel, 1850, *Junonia chorimene* Guérin-Méneville, 1844, *Catacroptera cloanthe ligata* Rothschild & Jordan, 1903, *Neptis kiriakoffi* Overlaet, 1955, *Neptis morosa* Overlaet, 1955, *Acraea caecilia* Fabricius, 1781, *Sarangesa laelius** Mabille, 1877, *Astictopterus abjecta** Snellen, 1872, *Borbo perobscura* Druce, 1912, *Borbo gemella** Mabille, 1884, and *Gegenes hottentota* Latreille, 1824. Most of these are found also in degraded parts of the forest zone, and many must now be much more common outside of the savannahs than they were a hundred years ago (those marked * are poor colonizers of the forest zone).

The savannah fauna is also strongly negatively characterized by the absence of two major entities of the forest. There are virtually no members of the curious Lycaenidae belonging to the subfamily Lipteninae – they are represented by no fewer than 112 in the forest zone. Similarly, almost of the Nymphalidae in the tribe Adoliadini are absent – they have about 80 species in the forest zone: these are the characteristic large "forest-floor butterflies" that are ever-present on forest paths. Both groups are largely missing in even extensive riverine forest such as in Kalakpa and Bui.

With 89% of all the Guinea Savannah species already recorded from within the protected areas system, despite the relatively low collecting effort, the coverage of the fauna must be considered very good. In fact, a smaller area would certainly suffice as far as butterfly conservation is concerned. What is important is that both Kalakpa and Digya have large areas of the forest-savannah transition habitats that can be used for future studies. The likely disappearance of most of the savannah/forest habitat once the dam at Bui has been built will not have a significant impact on butterfly conservation, though the habitat may well contain aquatic and semi-aquatic organisms that are not found in Kalakpa and Digya with much smaller rivers and less seasonal inundation.

Fig. 3.3.4.1. The guineafowl butterfly (*Hamanumida daedalus*), common in savannah habitats and increasingly invading degraded areas of the forest zone. It likes watermelon.

iii) The Sudan Savannah: One element that is noticeably missing from the protected areas system is that of the Sudan Savannah. No less than 20 Sudanian species of the 48 known from Ghana are not yet recorded. Most of these are well protected in national parks of neighbouring countries. During the current mission it was hoped to find a focal point for the Sudan Savannah species. This was not to be the case – much to the author's disappointment. It seems that the Sudanian species are mainly in Ghana on an opportunistic – perhaps not even permanent – basis. Some are even occasionally displaced to the coastal areas by the dry season "harmattan" winds.

The main presence of Sudan Savannah species are in the northwestern parts of Ghana, especially in the area between Wa and Lawra. They are less prominent in Gbele National Park, the northernmost park in Ghana, which is essentially composed of Guinea Savannah. They recur on the Gambaga Escarpment and intensify towards Bawku and further north. Just possibly some of the tiny forest reserves north of Bawku have a true Sudan Savannah habitat and fauna.

Since northern Ghana is obviously just on the frontier of the Sudan Savannah, and given the amount of effort expended by the author to search for these species, the following description of this interesting faunal element is given in table 3.3.8. Of the 48 species than can be considered Sudanian elements, 20 (42%) have not been found within the protected areas system, while 28 (58%) have.

Table 3.3.8. An annotated list of the Sudan Savannah butterflies known from Ghana.

= within the protected areas system
~ = not within the protected areas system

~*Pinacopteryx eriphia tritogenia* Klug, 1829 was recorded from Nakpanduri by Father Maessen (Allyn Museum).
~*Colotis vesta amelia* Lucas, 1852 was collected by both Father Maessen and Larsen on the Gambaga Scarp; it was also found near Bawku during the current mission.
~*Colotis celimene sudanicus* Aurivillius, 1905 was found by Brother van Dinther at Wa and Kaleo.
~*Colotis ione* Godart, 1819 was recorded from northern Ghana by Dudgeon (1915); it was found at Gambaga during the current mission, but not by Father Maessen or Brother van Dinther.
~*Colotis danae eupompe* Klug, 1829 was recorded from northern Ghana (Dudgeon 1915); many were caught at Nakpanduri by Father Maessen and at Kaleo and Wa by Brother van Dinther. The author never saw it.
Colotis aurora evarne Klug, 1829 is known from northern Ghana (Dudgeon 1915) and has been found at Nakpanduri, Kaleo and Wa. During the current mission a resident colony was found at Gbele, the first inside the protected areas system. One was seen in central Accra, obviously transported south by the harmattan (Larsen 2005a).
Colotis antevippe antevippe Boisduval, 1836 is common in the Gambaga area and around Kaleo and Wa, It extends south during the dry season and has been found in Cape Coast and Achimota. It is known from Kogyae and Shai Hills.
Colotis evagore antigone Boisduval, 1836 is often common in the Gambaga area, but may extend south during the dry season. It has been recorded from Mole and Shai Hills.
Belenois aurota Fabricius, 1793 is a strong migrant that can turn up almost anywhere, but it does not much do so in Ghana. Father Maessen's huge collection has just two strays from Likpe. The author caught singles at Wli Falls, Boabeng-Fiema, Bia, and Kintampo. Brother van Dinther found it commonly in the Wa area.
Belenois creona Cramer, 1776 migrates southwards on a regular basis and may be found in the forest zone on an irregular basis. It may sometimes breed there but does not establish permanent populations.
Belenois gidica Godart, 1819 is known from a few specimens from the 'Northern Territories' dating back to colonial times. Brother van Dinther caught a few around Wa and Father Maessen at Nandom. It is often common in the Shai Hills, a good illustration of the effects of the Dahomey Gap – from here it apparently extends as far west as Winneba from time to time (Kühne 1999).
Belenois subeida frobeniusi Strand, 1909 was found common at Lawra (Seth-Smith 1938) and also at Nakpanduri by Father Maessen. The author found it common at Mole in August 1996.
~*Dixeia doxo doxo* Godart, 1819 was found at Nakpanduri by Father Maessen and there are some old records from the 'Northern territories'. It should occur in Gbele.
~*Dixeia orbona orbona* Geyer, 1832 is known from a few collected by Father Maessen near Bole and by Brother van Dinther near Wa. It should occur in Gbele, and perhaps Mole
~*Apharitis nilus* Hewitson, 1865 is known from just two Ghana specimens in the Natural History Museum,

London: one is from Gambaga and another from Ho (doubtless in the dry parts of the Dahomey Gap). Brother van Dinther found it near Wa.
****Zeritis neriene*** Boisduval, 1836 is very rare in Ghana and has been recorded from Whydah and the northern Kyabobo area. It is essentially a Sudan Savannah species that extends down the Dahomey Gap.
****Axiocerses amanga*** Westwood, 1881 was once found by Father Maessen in the savannahs near Ho. Brother van Dinther found it near Wa. The author caught a few at Gbele as the first within the protected areas system.
****Iolaus menas menas*** Druce, 1890 is known from northern Ghana (eggs and young larvae are not uncommon, but the later stages are hard to find (Seth-Smith 1938)). The author found it at Nakpanduri. It also occurs in some savannah areas in the Volta Region, including Kyabobo.
~Iolaus ismenias Klug, 1834 is widespread in the extreme north of Ghana and extends south through the Dahomey Gap, spreading west along the coast to Teshie, Winneba, and Cape Coast. It must occur in Shai Hills, Mole, and Gbele.
~Iolaus alienus bicaudatus Aurivillius, 1905 is a species of extremely arid habitats. Brother van Dinther collected an unusually large female near Wa.
~Iolaus scintillans Aurivillius, 1905 was recorded in northern Ghana, just once, beaten from its *Loranthus* host-plants (Seth-Smith 1938). One was collected by Father Maessen near Kpandu, indicating that the dry zone extends south also along Lake Volta.
~Stugeta marmoreus marmoreus Butler, 1866 is known commonly from the Wa area (van Dinther). There is also a Volta record. It must occur in Gbele and probably Mole.
~Deudorix livia Klug, 1834 was recorded from Lawra (Seth-Smith 1938) and Nakpanduri (Larsen). Just possibly these were *Deudorix dinochares* Grose-Smith, 1887; *D. livia* is essentially a species of the Sahel.
****Anthene amarah*** Guérin-Méneville, 1847 is widespread and reaches the coast via the Dahomey Gap, though not commonly. From the protected areas system it is known from Kalakpa and Boabeng, but must also be in Mole and Gbele.
****Anthene talboti*** Stempffer, 1936 was unexpectedly collected at mud-puddles in Mole by the author in August 1996. There are no records from elsewhere in West Africa, the nearest known populations being in northern Uganda.
****Tuxentius cretosus nodieri*** Oberthür, 1883 is widespread in northern savannahs where its host plants, species of *Zizyphus*, are present. These are also the host plants of the *Tarucus*, which are often found with it. The species has been found in Mole and Gbele, and rather surprisingly in Bui.
****Tarucus ungemachi*** Stempffer, 1944 is found in northern Ghana (Bole, Wa, Nakpanduri). The author found it quite common in Mole, less so in Gbele. It both localities it was located by searching for small thickets of the *Zizyphus* host-plants.
****Tarucus rosacea*** Austaut, 1885 was caught in Mole, October 2002, by J. Ciha. The abdomen was sent to Hanoi and the identity checked through the male genitalia.
~Cupidopsis jobates jobates Hopffer, 1855 was collected at Teshie by T. Helps. The area around Teshie is effectively part of the Dahomey Gap. The species should also occur in northern Ghana.
****Euchrysops reducta*** Hulstaert, 1924 is a typical Sudan Savannah species that is generally rare in collections. It has been collected in a number of places, including Mole and Kogyae, but during the present mission was found common in Gbele and on the Gambaga Scarp.
****Euchrysops sahelianus*** Libert, 2001 is a rare species of the Sudan-Sahel transition which had been recorded from Bole, Mole, and Wa. During the present mission it was found to be very common throughout Gbele. A record from Kogyae is probably in error for the previous species.
~Azanus ubaldus Cramer, 1782 the only Ghanaian material was collected by Brother van Dinther from near Wa. The species is migratory and should occur in other parts of the north from time to time.
****Azanus jesous*** Guérin-Méneville, 1847 was collected in the Volta Region by Father Maessen and in Wa by Brother van Dinther. Though the species is somewhat migratory and not as strictly northerly as *A. ubaldus*, numbers are few. During the present mission a single male was found in Gbele.
****Azanus moriqua*** Wallengren, 1857 is a Sudanian element that is well-known also from the Guinea Savannah. Nonetheless records from Ghana are few (Kyabobo, Kogyae, Mole, Gambaga, Wa).
~Chilades eleusis Demaison, 1888 is known only from Nandom and the Bolgatanga area (Kühne 1999). Just possibly it occurs in Gbele, but it needs short grass with low *Acacia* shrubs.
~Ypthima asterope asterope Klug, 1832 was definitely figured on a map from the extreme north of Ghana in Kielland's revision of the genus. The author caught one at Nakpanduri in September 1995. Most records of this species from West Africa actually refer to *Y. condamini* which is common in the Guinea Savannah.
****Charaxes viola*** Butler, 1865 is common in the north, straying quite far south on occasion. It is known from Digya, Gbele, Shai Hills, Wa, and Gambaga.
****Junonia orithya madagascariensis*** Gueneé, 1865 is essentially a species of the Sudan Savannah but is very

mobile and sometimes migrates in numbers. It is usually common on the Gambaga Escarpment and in the Wa area. During the present mission a few were found at Gbele, but there is none from Mole, though it has been found at Wli, Boabeng, and Shai Hills.
Junonia hierta cebrene Trimen, 1870 is also essentially a species of the Sudan Savannah but is very mobile and sometimes migrates in numbers, being more frequent in the south than is *Junonia orithya*. Within the protected areas system it is known from Gbele, Mole, Kyabobo, Digya, Kogyae, Boabeng, and Shai Hills.
~Byblia ilithyia Drury, 1773 was recorded from the north by Seth-Smith (1938). Brother van Dinther caught one at Wa. Father Maessen never came across it. It probably only just penetrates Ghana.
Acraea caecilia caecilia Fabricius, 1781 is essentially a Sudan Savannah species that drifts south on the harmattan winds during the dry season. It is common in Gbele and Mole, but has also been found in Kyabobo, Bui, and Boabeng. It extends to Cape Coast along the southern dry forests.
~Sarangesa phidyle Walker, 1870 is known only from an old record from the north, very likely from the vestiges of Sudan Savannah north of Bawku.
Caprona pillaana Wallengren, 1857 this species is common in eastern and southern Africa but there are few West African records in print, all from Nigeria. It came as a surprise that Father Maessen collected a few at Nakpanduri on the Gambaga Scarp. During the present mission one was found in Gbele, the first record from a national park, and a significant westward extension of range. The close relative, *C. adelica* Karsch, 1893 is linked to the Guinea Savannah.
Abantis pseudonigeriana Usher, 1984 is a very rare butterfly that has been recorded from Mole, Kaleo, Yendi, and Kyabobo.
Spialia spio Linné, 1767 is a common butterfly in much of dry Africa but seems to be very scarce in Ghana. Father Maessen never came across it. The author found it in Kogyae, Nakpanduri, Kyabobo, and near Kumasi. It must be in Gbele and Mole.
Spialia diomus diomus Hopffer, 1855 is another common dry-zone butterfly that seems very scarce in Ghana. Father Maessen never found it. The author has seen it in Nakpanduri and Boabeng. It must be in Gbele and Mole.
Parosmodes morantii axis Evans, 1937 is generally a very rare butterfly. Just three Ghana records are on hand, two from the protected areas. Father Maessen took one in the Shai Hills; the author found it at Nakpanduri in 1995 and in Kyabobo during the present mission.
~Gegenes 'pumilio' gambica Mabille, 1878 has been found on a number occasions in the Gambaga-Nakpanduri area, extending south to Yendi. A few were seen at Nakpanduri during the present mission. None is known from the protected areas system.

There is a small number of additional West African Sudan Savannah species not recorded from Ghana; some of these may occur in the north, though perhaps most may not: *Nepheronia buquetii* Boisduval, 1836, *Colotis amata* Fabricius, 1775, *Colotis phisadia* Godart, 1819, *Colotis chrysonome* Klug, 1829, *Colotis halimede* Klug, 1829, *Colotis liagore* Klug, 1829, *Colotis eris* Klug, 1829, *Pontia glauconome* Klug, 1829, *Tarucus theophrastus* Fabricius, 1793, *Tarucus legrasi* Stempffer, 1948, *Tarucus balkanicus* Freyer, 1843, *Tarucus kiki* Larsen, 1976, *Lepidochrysops polydialecta* Bethune-Baker, 1923, and *Gegenes nostrodamus* Fabricius, 1793. These species are characteristic of northern Senegal, Mali, parts of Burkina Faso, and Niger.

This review indicates that the Sudan Savannah species known from Ghana do not have a genuine focal point. Records are most frequent from the Gambaga Escarpment and from the Wa/Lawra area. They appear quite poorly represented even in Gbele, the most northerly in the protected areas system. If one or more of the small forests north of Bawku do have true Sudan Savannah habitats, they should be given special protection.

3.3.4.d The ubiquitous species

Table 3.3.9. The ubiquitous species in Ghana, their presence in the protected areas system, and their migratory status.

Species (migratory=mig) and presence (#)			Localities as in other tables							
13	Papilio demodocus	mig	#	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
29	Graphium leonidas	mig	#	BOM	BUI	mol	gbe	dig	KOG	kal	SHH
36	Catopsilia florella	mig	#	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
39	Eurema hecabe	mig	#	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
40	Eurema floricola		#	ooo	BUI	mol	???	DIG	kog	KAL	???
42	Eurema desjardinsii		#	bom	bui	mol	GBE	DIG	kog	KAL	SHH
63	lotis euippe		#	BOM	BUI	MOL	GBE	dig	KOG	KAL	SHH
87	Appias epaphia	mig	#	bom	BUI	mol	???	dig	KOG	kal	SHH
95	Mylothris chloris		#	BOM	BUI	MOL	GBE	DIG	kog	KAL	SHH
567	Lampides boeticus	mig	#	BOM	bui	MOL	gbe	dig	kog	kal	SHH
575	Cacyreus lingeus		#	bom	BUI	mol	gbe	DIG	KOG	KAL	SHH
578	Leptotes pirithous	mig	#	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
580	Leptotes jeanneli		#	bom	bui	MOL	gbe	DIG	kog	kal	shh
601	Euchrys. malathana	mig	#	bom	bui	MOL	gbe	DIG	KOG	kal	SHH
630	Azanus mirza		#	bom	bui	MOL	gbe	dig	KOG	KAL	shh
635	Zizeeria knysna		#	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
637	Zizula hylax		#	bom	bui	mol	gbe	dig	kog	KAL	shh
647	Danaus chrysippus	mig	#	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
658	Melanitis leda		#	bom	BUI	MOL	GBE	dig	KOG	KAL	shh
659	Melanitis libya		#	bom	bui	MOL	gbe	dig	kog	kal	ooo
791	Vanessa cardui	mig	#	bom	bui	MOL	gbe	dig	kog	kal	shh
801	Hypolimnas misippus	mig	#	BOM	BUI	mo;	GBE	DIG	KOG	kal	SHH
814	Junonia oenone	mig	#	BOM	BUI	MOL	gbe	DIG	KOG	KAL	SHH
826	Byblia anvatara	mig	#	bom	BUI	MOL	GBE	dig	KOG	KAL	SHH
1153	Acraea encedon	mig	#	bom	BUI	MOL	GBE	dig	kog	kal	SHH
1159	Acraea serena	mig	#	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
1178	Acraea pseudegina		#	ooo	bui	mol	ooo	DIG	KOG	KAL	ooo
1185	Acraea neobule	mig	#	bom	bui	mol	GBE	DIG	KOG	KAL	SHH
1200	Phalanta phalantha	mig	#	BOM	BUI	mol	GBE	DIG	KOG	KAL	SHH
1207	Coeliades forestan	mig	#	bom	bui	mol	gbe	dig	KOG	KAL	???
1444	Pelopidas mathias	mig	#	bom	BUI	MOL	GBE	DIG	KOG	kal	SHH
1445	Pelopidas thrax	mig	#	bom	BUI	MOL	GBE	dig	kog	kal	shh
1453	Borbo fatuellus		#	BOM	bui	MOL	gbe	DIG	KOG	KAL	SHH

The clear ecological zonation and biogeographical partitioning is underscored by the very limited number of species that can be considered ubiquitous, which account for 33 out of the 925 Ghana butterflies (just 3.6% of the total) (table 3.3.9). It almost goes without saying that all are well-known from many of the protected areas. Most of these must originally have been savannah butterflies that have managed fully to colonize the forest zone. Most of them would probably have been scarce in forest areas till large scale anthropogenic habitat degradation began. Even today, most of them are scarce in undisturbed forests, mainly found in areas with open rocks or along wide river valleys. The distribution of the ubiquitous species is assisted by the fact that as many as 20 have a more or less developed migratory capacity (indicated with mig in the table).

These species could be considered savannah elements that have extended distributions, but those in the table do have permanent breeding populations in the forest zone that other savannah species occasionally found there do not.

With few exceptions the ubiquitous species tend to be common. In the table their known presence in the savannah locations of the protected areas system is given. Though in many cases little collecting has taken place, these species have been found in two-thirds of all the possible localities.

3.4 Recapitulation of butterfly coverage by the protected areas system

Generally speaking the degree of coverage of Ghana's butterfly fauna by the protected areas is good. Four-fifths of all known species have been positively recorded from within the system (details in table 3.4.1).

Table 3.4.1. The butterflies of Ghana by ecological categories and the degree of coverage by the protected areas system areas system (including Volta Region, which is also shown separately).

Main ecological zones	Ghana	System	System %
Forest butterflies*	757	603	80%
Guinea Savannah butterflies	83	74	89%
Sudan savannah butterflies	48	28	58%
Ubiquitous species	33	33	100%
Special habitats	4	4	100%
GHANA TOTAL	925	742	80%
Volta Region total fauna	641	474	74%

* note than in other parts of this report the ubiquitous species and those of special habitats are included as forest resident species.

The forest butterflies have a total recorded coverage of 80% of all known Ghana species. The remaining 20% is partly due to many of the forest butterflies being rare and/or difficult to find. With more collecting, the coverage will increase. The three main forests (Ankasa, Bia, and Kakum) are well chosen, though their size at no more than a few percent of the original forest cover is very small. Consideration should be given to: 1) increasing the size of Ankasa/Nini Suhien by incorporation of the contiguous Draw River Forest Reserve (GSBA); 2) the incorporation of the Prah Suhien Forest Reserve into Kakum; 3) the protection status of any remaining forest in the main (central) mountains of the Volta Region need improvement to avoid that Wli Falls becomes a tiny, isolated fragment that cannot refresh its current biodiversity in the face of inevitable local extinctions of species from time to time: the 74% total species coverage is quite low, and it is lowest in the forest fauna; 4) At least some GSBAs in the intervening areas between the three major national parks should be

incorporated in the protected areas system, or their protection status otherwise strengthened, to provide both more volume and "stepping-stones" between the major parks.

However, upland evergreen forest (Atewa Range and Tano Ofin) is by all indicators the greatest lack in the coverage of the protected areas system. There is no doubt that the Atewa Range has the richest butterfly population in Ghana, including two strictly endemic species, as well as many species not found anywhere else in Ghana [and each special butterfly species acts as a proxy for 800 other organisms]. Atewa would add about 90 forest butterflies not recorded from within the protected areas system, including the two narrowly endemic species and one strictly limited to upland forest; many other of the 90 species are unlikely not to be found elsewhere in Ghana and some or excessively rare on a pan-African basis. Though classified as a GSBA its protection status is inadequate. Apparently illegal logging is still serious in the southwestern parts of the range, though it has declined at the northern end near Sagyamase. For nearly fifty years the question of mining of bauxite on the Atewa Range has been discussed. The bauxite deposits almost exactly match the extent of upland forest – and may indeed be one reason for its special faunal composition. If mining on Atewa were ever to be deemed important enough to override conservation and tourism concerns, it would have to take place under strict environmental controls.

The southern and southeastern outlier forests are not well covered by the protected areas system, though there are substantial fragments in the Shai Hills – and perhaps in Kalakpa. Most of these forests now exist in tiny fragments, some as forest reserves and more as sacred groves that are becoming increasingly less sacred. These forests are known to have a limited flora, but one that contains large numbers of endemic species. The common skipper butterfly, *Pyrrhiades lucagus* Cramer, 1777 is loosely associated with this vegetation from Addah and Shai Hills along the coast as far as San Pedro in Côte d'Ivoire. It also permits the extension of certain savannah species along the coast. The botanical data argues in favour of a closer protection of this habitat.

The Guinea Savannah habitats within the protected areas system is extensive and distributed over eight localities, well distributed from south to north, covering the forest-savannah transition as well as the savannah proper. Almost 90% of all the species that could occur in Guinea Savannah have been recorded, despite rather low collecting intensity, and the rarer missing species will certainly be found eventually. The forest/transition zone of Bui National Park will largely disappear when the hydroelectric dam is built. No significant butterflies will be endangered by this though as the only extensive seasonally-flooded riverine forest area in Ghana it may well have an impact on aquatic and semi-aquatic insects that are not found elsewhere in the country.

The Sudan Savannah butterflies were studied in detail. Of the 48 Sudanian elements identified, 20 are so far absent from the protected areas system. This element in Ghana appears to be opportunistic and having no major geographical focus, occurring in a haphazard manner along the northern frontier. Possibly one or two of the small forests north of Bawku have a Sudanian flora, in which case they should be protected. However, Sudanian flora and fauna is extensively covered by protected areas in Burkina Faso, Bénin, and Niger.

3.5 Conclusions on the coverage of the protected areas system

The current protected areas system in Ghana largely seems to fulfill the main objectives laid down as far as the preservation of biodiversity in perpetuity is concerned. The ecological coverage generally seems to be well conceived, though balanced in favour of savannah habitats. Most of it remains in good or reasonable condition. The butterfly data indicate that it has a high degree of coverage of the total fauna but, as repeatedly emphasized, the absence of upland forest is a major omission. The three major national parks in the forest zone should probably be enlarged (this is not possible for Bia). It would be desirable to include some forest in good condition in areas in-between the major parks, both to increase the size of fully protected forests and to act as stepping-stones for continued potential gene-flow between the existing parks that are destined to become increasingly isolated. It must recognized that some of the best and most interesting forests in Ghana have been given the status of GSBAs (Globally Significant Biodiversity Areas) and most of these have been carefully demarcated by the Forestry Division. However, many observers have noted that some GSBAs are subject to illegal logging and to encroachment for agricultural purposes. On the other hand, simply making them part of the protected areas system is no panacea, unless the necessary resources are available. An intermediate approach might be possible, where some of the most crucial GSBAs are given a special level of attention. However that may be, the 925 butterfly species act as a "rough and ready" proxy for 690,000 – 830,000 other organisms – possibly many more – about which virtually nothing is known, most of which will also be found within the protected areas system. In 1962, the Chief Conservator of Forests, A. Foggie, made a statement on Ghana's forests. He was looking at them mostly from a forester's standpoint, but his statement is quite appropriate when applied to Ghana's present efforts to conserve its overall biodiversity.

> "The existing [forest] reservation, though not ideal, is greater and better balanced than in any other comparable area in Africa and, if preserved in perpetuity, as is the present intention, will ensure that Ghana never suffers the troubles of a deforested country, nor will have to correct past mistakes by an expensive afforestation programme such as Great Britain was forced to undertake"

Fig. 3.5.1 *Pseudacraea semire* as illustrated in the original publication by Cramer in 1779.

4. REVIEW OF INDIVIDUAL LOCALITIES

The following sections provide a capsule résumé of the butterflies known and estimated to occur in the 15 protected areas and in a further 8 significant locations that have been under consideration for further conservation measures, including Bobiri and Bunso that are both designated as "Butterfly Sanctuaries".

In each of the 23 brief locality descriptions given in this chapter the number of species recorded and an estimate of the true total are given. The estimates were made as follows: Step 1 was the identification of all species collected in a given locality, mostly by the author and his collaborators, but also records from collections (especially the Natural History Museum, London and the African Butterfly Research Institute, Nairobi) and the literature. Step 2 was to assess which other species might be in the locality, based on general knowledge of the distributions and habitats elsewhere in Ghana. Some were classified as "almost certain to occur" and 75% of their number was added to the known total; others were classified as being "possible to occur" and 25% of their number was added to the known total. These are the data entered in appendices 1a and 1b. The precision of the estimated totals depends on the known totals. The more species positively recorded, the more precise the estimated total. In cases where the actual number recorded is less than half of the estimated total, the level of precision begins to be low. The locations are shown in the map below (fig. 4.0.1).

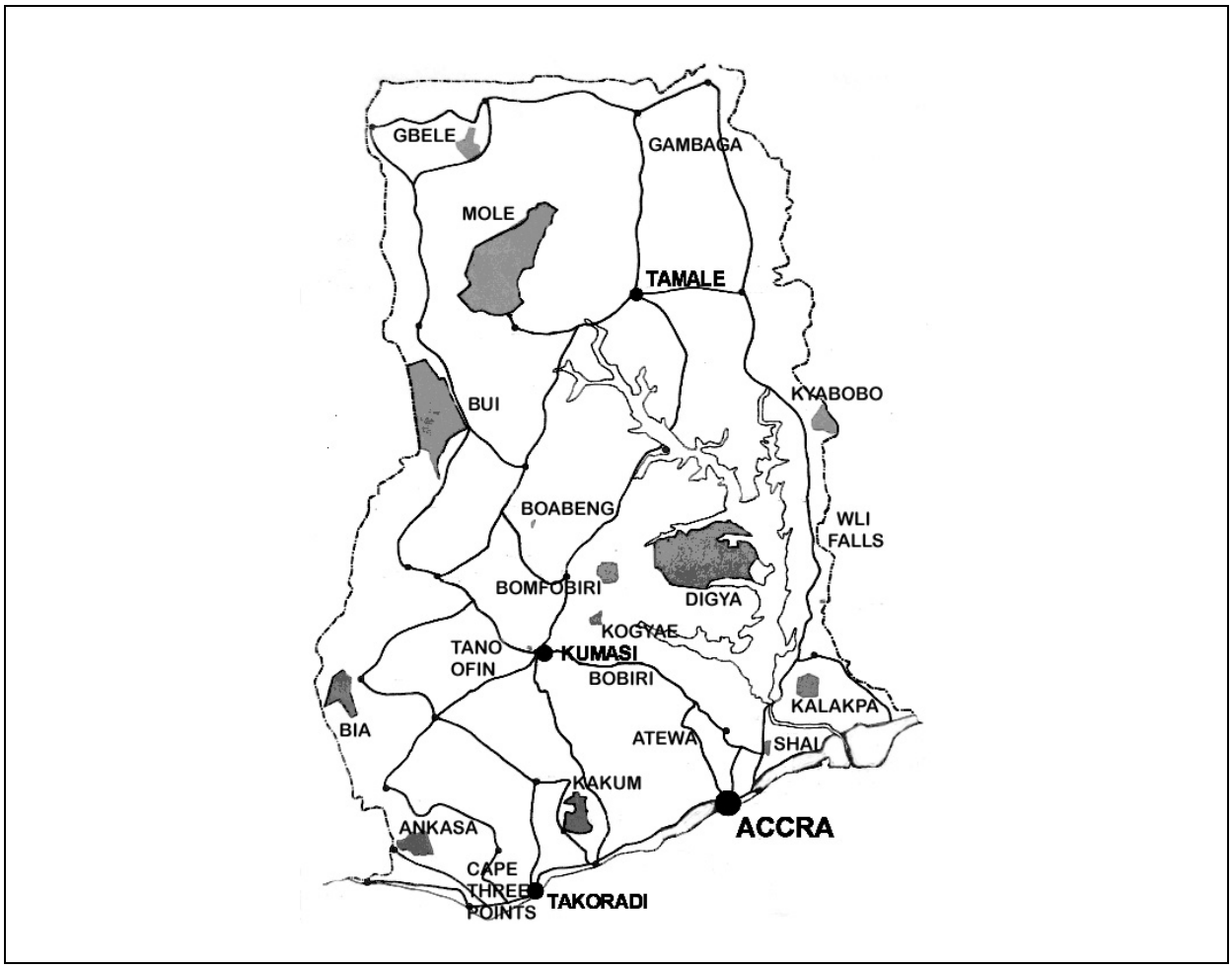


Fig. 4.0.1. Map of the protected areas system and other localities covered by this report.

Table 4.0.1 summarizes the butterfly numbers from the single localities in various parts of Africa from where adequate and reliable data are available. They are rather few in number: in fact more are published for the first time in the present report than have ever been published elsewhere. This is mainly because very few localities have been monitored consistently for a sufficient period of time. As shown in table 3.3.1 some 40 field-days are necessary to obtain about half the total butterfly fauna present. In just a few cases have such inputs been available AND systematically recorded. Pride of place must go the study of two forested hills near Yaoundé in Cameroun conducted by Libert 1994, who reached 800 species and effectively failed to find any additional species on most of his last series of visits. Kakamega forest in Kenya has been intensively collected since about 1920, as well as recently (the African Butterfly Research Institute, Nairobi instituted an intensive collecting programme during the 1990s). Many Kakamega records can be found in the literature and large numbers of butterflies from there are deposited in museum collections. All data were collated by Kühne *et al*. (2004) in what is probably the most intensive butterfly survey of a significant forest in Africa, with 490 species documented. Between 1967 and 1978 a secondary habitat at Agege, about 20km north of Lagos was intensively collected to the point where a new species was only collected on every two or three visits (Larsen *et al*. 1980). A total of 385 species were finally recorded, at the time by far the largest number from a single locality anywhere in Africa.

Table 4.0.1. Butterfly species recorded and estimated totals for selected localities in Africa.

Locality	Species recorded	Estimated totals	Per cent*
Oban Hills, Nigeria (Larsen 1997d)	800	1,000	80%
Mount Fébé/Messa, Cameroun (Libert 1994)	800	850	95%
Okwangwo, Nigeria (Larsen 1997d)	620	950	65%
Atewa Range Ghana (present report)	572	697	82%
Kakum, Ghana (present report)	493	627	79%
Kakamega, Kenya (Kühne *et al*. 2004)	490	500	98%
Korup, Cameroun ** (Larsen 1997d)	480	1,000	48%
Bia, Ghana (present report)	408	668	61%
Kyabobo, Ghana (present report)	402	495	81%
Ankasa, Ghana (present report)	398	639	62%
Agege Secondary, Nigeria (Larsen *et al.*1980)	385	420	91%
Wli Falls, Ghana (present report)	326	503	65%
Boabeng-Fiema, Ghana (present report)	252	352	72%
Mole, Ghana (present report)	149	84	56%

* Actual records in percent of estimated total.

** The Korup actual is rather low and would not have been included were it not for the fact that it shares a long border with the Oban Hills and must contain most Oban Hills species.

During the 1990s intensive research in the Cross River Loop in Nigeria indicated that total species numbers in the Oban Hills and in Korup National Parks were 1,000 and those of Okwangwo National Park just north of the Cross River were 950 (Table 4.0.1). The forests on the Nigeria/Cameroun border doubtless have the largest number of butterflies anywhere in Africa – Oban Hills and Korup jointly have about 1,100. The reason for this is that the area has survived as well-differentiated forest habitats during all the periods of contraction and re-expansion of the forest biome, as climate became drier/colder and wetter/warmer, AND has been able to recruit its fauna both from the east and from the west.

In Ghana data of sufficient quality from major forests are available from Ankasa, Bia, Kakum, and the Atewa Range. These are generally consistent in showing that a reasonably large forest in good condition will have an estimated total of about 650 species. As shown in table 3.3.4, however, there are clear differences in the composition of the butterflies, none of which is found in all of the forests. Also, the Atewa Range is somewhat richer than the other three with a total of 700 species. This is no artifact: both Kakum and Atewa Range have about 80% of their total positively recorded. Though less than on the Nigeria/Cameroun border, 650 butterfly species in a single locality is still a considerable number, given that the fauna west of the Dahomey Gap is less rich than that between eastern Nigeria and Congo, or the Ituri/Ruwenzori region of the Democratic Republic of Congo. Atewa has almost as many species as all of North America (without the tropical parts of Mexico).

The data from Boabeng-Fiema are also interesting. Lying as it does at the northern frontier of the forest zone it probably never had more than about 475-525 species since many evergreen forest species would be missing. The estimated total of 350 (based on 250 recorded) was confirmed independently by a special statistical technique (see section 4.1.3). The remaining forest is tiny (less than $2km^2$) and wholly isolated from any forest by derived savannah – any extinction of a local population of forest butterflies would probably not be re-established. Yet about two-thirds of the original fauna still survives.

The data from Wli Falls, another tiny forest (about $3km^2$), rather contrasts with Boabeng-Fiema. The estimated total of 503 species (based on 326 actually recorded) comprises 78% of the 642 species known from the Volta Region. There has been catastrophic deforestation in the mountains of the central Volta Region quite recently and the richness of Wli Falls must be assigned to its role as a refuge for the forest fauna – it may well be that species-richness at Wli Falls is currently at its apogee. As forests in its immediate area continue to be degraded or to disappear, local extinctions in the sanctuary may eventually not be re-established. It must be feared that butterfly biodiversity at Wli Falls could gradually decrease.

The data from savannah areas differ strongly from those of the forest zone. The number of butterfly species is much lower. In the parks without large areas of riverine forest (such as Kalakpa and Bui) the absence of forest butterflies leads to total species numbers are only about 150.

4.1 Summaries of the protected areas system (15 locations)

4.1.1 *ANKASA RESOURCE RESERVE-NINI SUHIEN NATIONAL PARK

Ankasa-Nini Suhien covers 490 km^2 of wet evergreen forest, the only protected area to cover this type of vegetation. The forest has a lower canopy than the drier, more northerly types and has a high degree of endemic plants, testifying to its role as a main refuge area during dry periods when the West Africa forests contracted strongly. At such points the remaining forests in Ghana and eastern Côte d'Ivoire were isolated from their counterparts in Liberia and the extreme east of Côte d'Ivoire. Most of the forest is in excellent condition. The undergrowth structure often makes movement more difficult than in other forest types in the absence of paths.

The first recorded butterflies from Ankasa were collected by C. Belcastro during the 1980s, most of which were inspected by the author on a study visit to Rome. During the 1990s the author paid seven visits to Ankasa during the months of January, April, August, and December. In October and November of 2000 a review of the butterflies was commissioned by the Protected Areas Development Programme for Western Region (PADP) under the then Ghana Wildlife Department. A few additional species not previously known were procured by collectors from the African Butterfly Research Institute, Nairobi (Larsen 2001). Thus Ankasa - together with Kakum, Bia, Kyabobo, and the Atewa Rage - are among the most thoroughly investigated in Ghana. The estimated total species number is 639 as shown in table 4.1.1. below. It was never practicable for the author to reach deep into the Nini-Suhien area but collections of plants and small mammals indicate that differences between the two areas are relatively minor. Because of the intensive previous investigations Ankasa was not visited during the present mission.

Table 4.1.1. Summary of the number of the butterfly species known and estimated in Ankasa National Park/Nini-Suhien (based on a total of 925 Ghana species as enumerated in Appendix 1a)

Estimated total butterfly species in Ankasa/Nini-Suhien	**639**
Species that have been positively recorded and accepted	398
Species almost certain to occur 280 (75% included in estimate)	210
Species that possibly occur 125 (25% included in estimate)	31
Species that almost certainly do not occur 128 (none included)	0
% of estimated total positively recorded: 62%	

Given the strong element of plant endemicity in Ankasa (the highest "genetic heat index" in Ghana) it was surprising to find little trace of butterfly endemicity, though probably some Ghana and West Africa endemics originated there and have now achieved wider ranges than the plants. Three species occur that seem essentially linked to the Liberian subregion, in Ghana, being limited to Ankasa and the contiguous Draw River Forest Reserve (*Euriphene veronica* Stoll, 1870, *Euptera dorothea* Bethune-Baker, 1904, and *Ceratrichia crowleyi* Riley, 1925).

The acquisition curve for butterflies in Ankasa is now relatively flat, possibly because the low, dense forest makes access and mobility (for butterflies as well as their collectors) more difficult than in the semi-deciduous forests. One of the most notable features is the great diversity of the Hesperiidae and the presence of many rare species in this family. Thus the only known Ghana specimens of *Loxolexis holocausta* Mabille, 1891, *Paronymus nevea* Druce, 1910, *Pteroteinon capronnieri* Plötz, 1879, *Caenides dacenilla* Aurivillius, 1925, and *Caenides otilia* Belcastro, 1990 are from Ankasa.

In the recent book on the butterflies of West Africa *Celaenorrhinus ankasa* Larsen & Miller, 2005a was described and named after the park – it has also been found on the Atewa Range, near Takoradi, and in Bobiri. Only four specimens are known to date. Among other rare species are *Iridana exquisita* Grose-Smith, 1898, *Bicyclus trilophus jacksoni* Condamin, 1961, *Charaxes hadrianus* Ward, 1871, *Pseudacraea hostilia* Drury, 1782, and *Teniorhinus watsoni* Holland, 1892. The curious Lycaenid subfamily, the Lipteninae (and especially the Epitolini), is strongly under-represented. The Liptenids live commensally with the *Crematogaster*-ants that build beehive-like nests, usually in tall trees, and the low canopy and narrow girth of most of the trees may be a limiting factor (for the Epitolini also the absence of open spaces for their parade-flights). This group may be better represented in northern Nini-Suhien.

However, there can be no doubt that Ankasa fulfils an important role in maintaining biodiversity. It has repeatedly been suggested that the Draw River Forest Reserve should be amalgamated with Ankasa. The two are contiguous: the elephant population migrate between Ankasa, Nini-Suhien, and Draw River so this remains a reasonable suggestion, not least considering the basically a very modest amount of wetter forests within the protected areas system.

Fig. 4.1.1. *Pseudopontia paradoxa* photographed at Ankasa Camp. The species is rare in Ghana and is interesting as the only member of an entire subfamily of the Pieridae. "The Ghost" is its appropriate vernacular name.

4.1.2 *BIA NATIONAL PARK AND RESOURCE RESERVE

Bia National Park covers 300km^2 of forest on the border between moist evergreen and moist semi-deciduous forest. It was – and is still – classified as a UNESCO World Heritage Site as being a site of almost intact virgin forest. However, during the 1970s the resource reserve was destructively logged and most of it does not currently qualify as closed forest. Only the 73 km^2 of the national park to the north remain in excellent condition. Apparently there are some indications that the forests of the resource reserve will regenerate in a satisfactory manner but this will be a process lasting more than fifty years. The addition of Krokosua Hills Forest Reserve to the protected areas system is still strongly recommended, especially since its hilly topography differs from that of the Bia National Park. However, Krokosua does not enlarge Bia since it is not contiguous.

There was little collecting in Bia National Park till the 1990s. A small list, with some interesting records, was compiled by Claude Martin (1982) during the late 1970s. Fortunately the most interesting records made by C. Belcastro during the 1980s were made available to this study, but a complete list was not drawn up. All other records are those made by the author on a number of visits between 1994 and 1996 (during May and December) , but especially during October and November of 2000 when a review of the butterflies in Bia and Ankasa was commissioned by the Protected Areas Development Programme for Western Region (PADP) under the then Ghana Wildlife Department (Larsen 2001). Since then there have been several expeditions under the auspices of the African Butterfly Research Institute, Nairobi. Because of the intensive previous investigations Bia was not visited during the present mission.

The estimated total for Bia is 668 species, one of the highest for Ghana. This is more than estimated for Ankasa and Kakum: most of the forest species occur in Bia, while its northerly position allows for more penetration of species from the dry forests and savannah zones. Only the Atewa Range has a richer butterfly fauna.

Table 4.1.2 Summary of the number of the butterfly species known and estimated in Bia National Park and Resource Reserve (based on a total of 925 Ghana species as enumerated in Appendix 1a)

Estimated total butterfly species in Bia NP & RR	**668**
Species that have been positively recorded and accepted	408
Species almost certain to occur 305 (75% included in estimate)	229
Species that possibly occur 123 (25% included in estimate)	31
Species that almost certainly do not occur 89 (none included)	0
% of estimated total positively recorded: 61%	

Bia currently protects a large proportion of the forest species in Ghana, including many of the species endemic to Africa west of the Dahomey Gap or its Ghana subregion. Among rare and/or interesting species are: *Papilio zalmoxis* Hewitson, 1864 (this is Africa's second-largest butterfly that is rare in West Africa and in Ghana known only with certainty from Bia), *Liptena rochei* Stempffer, 1951 (very scarce in West Africa), *Liptena similis* Kirby, 1890,

Micropentila adelgunda Staudinger, 1892, *Deudorix kayonza* Stempffer, 1956, *Anthene scintillula aurea* Bethune-Baker, 1910 (this very rare West African subspecies is also known from the Atewa Range), *Cymothoe weymeri mulatta* Belcastro, 1990 (this is the very rare West African subspecies), *Bebearia demetra* Godart, 1824, *Loxolexis dimidia* Holland, 1896 (a very rare butterfly; the Bia record is the only one west of the Dahomey Gap), and *Abantis tanobia* Collins & Larsen, 2005 [the species was caught during an African Butterfly Research Institute expedition in Tano Ofin as well as in Bia and hence given the name of both].

The network of paths that have been developed in Bia North are very good for butterfly observation and for butterfly study. When mangoes are in season fruit from the trees at Kunkumsi/Debiso Camp placed on the path leading from the compound to the forest proper (and on either branch of the first "**T**" on the path) sometimes attract almost unbelievable numbers of butterflies.

Bia North has seen a fair amount of research activities (primates, small mammals, reptiles) and the infrastructure at Kunkumsi/Debiso could become a focus for continued, income-generating international research activities.

Fig. 4.1.2. A male *Hallelesis halyma* in Bia. The species is endemic to the forests west of the Dahomey Gap; the only species in the genus is found from Nigeria to the Congo.

4.1.3 *BOABENG-FIEMA NATURE SANCTUARY

This tiny sanctuary of just 1.9km^2 consists of an isolated stand of dry semi-deciduous forest lying at the northern edge of what would once have been continuous forest. The forest was conserved because the communities of Boabeng and Fiema realized that the monkeys that were sacred in the history of the communities were everywhere disappearing as the forests were cut and replaced by open farmbush. At this latitude and climate the cleared land does not revert to forest but becomes derived savannah. The forest sanctuary is now effectively isolated from other forest fragments.

The visual aspect of the forest from several angles is quite spectacular since the edge rises vertically from completely open land. The forest is not in particularly good condition since the undergrowth is cut for firewood, but the canopy is reasonably intact. A dense network of paths makes studies very easy to conduct - it is possible to monitor the entire forest twice a day.

The villagers' intentions of conserving their sacred monkeys have manifestly succeeded. The forest has vigorous populations of both Mona Monkeys and Black-and-White Colobus Monkeys. Both species must occur with one of the highest population densities in West Africa and they are highly habituated to humans - it is possible to observe the entire gamut of monkey behaviour [including being showered by urine when a dominant male believes you are getting a bit too close] with an ease that is possible nowhere else.

The butterflies have mainly been studied through five one or two-day visits between 1993 and 1995 by the author (during the months January, April, June, and September). No visit was paid during the present expedition. The estimated total species number is 352 as shown in table 4.1.3 below. Because of the intensive previous investigations Boabeng was not visited during the present mission.

Table 4.1.3. Summary of the number of the butterfly species known and estimated in Boabeng-Fiema Nature Sanctuary (based on a total of 925 Ghana species as enumerated in Appendix 1a)

Estimated total butterfly species in Boabeng-Fiema N. S.	**352**
Species that have been positively recorded and accepted	252
Species almost certain to occur 68 (75% included in estimate)	51
Species that possibly occur 194 (25% included in estimate)	49
Species that almost certainly do not occur 411 (none included)	0
% of estimated total positively recorded: 71%	

The number of species "that possibly occur" (194) is high. In a larger forest many of these would have been classified as "almost certain to occur" but the small size of the sanctuary – and the relatively good level of investigation - precludes that all the many potential species could occur.

The estimate of 352 species reached by the general method used in this report matches exactly the higher limits of the statistical estimate produced by the EstimatesS methodology (the "Jack2 estimate") as well as my own simple graphical projection of the "collecting curve" (Colwell EstimatesS - from www). At the time when Boabeng-Fiema was in the extreme north of the continuous dry semi-deciduous forest zone it might have had a total fauna of 475-525 species. Thus, the forest definitely retains half its original butterfly fauna by actual count and probably more than two-thirds. These are amazingly high figures, given the tiny extent and the almost total isolation of the forest today. The author hopes to make further visits to Boabeng in order to make the estimates even more precise. The relatively low count of birds listed by Dowsett-Lemaire & Dowsett (2005) is perhaps not all that unexpected; total diversity of relatively large birds in such a tiny locality would a priori be lower than for butterflies and other invertebrates.

A tiny isolated forest the size of Boabeng-Fiema can hardly be expected to act as a major repository of important biological diversity. Its forest fauna largely consists of common and widespread species. There is, however, one very special butterfly in the form of *Euphaedra crossei* Sharpe, 1902, which was collected by the author in January 1995. It was later found in some numbers in forest fragments somewhat further north around Kintampo by C. Joly. One old specimen labelled only "Gold Coast" was also located in the Natural History Museum, London. This is a species so far known only from eastern Nigeria (east of the Niger River) – also at the northern edges of the forest zone proper – which is unusual for a member of this dedicated forest genus. The Ghana population was described as ssp. *akani* Hecq & Joly, 2004. There is no biogeographical parallel to this distribution in butterflies.

Fig. 4.1.3. A black-and-white colobus on the ground giving the village a once-over with the extended family. In most places even seeing one of these monkeys is quite unusual.

Long term monitoring of the butterflies (and other components) of Boabeng-Fiema would be highly desirable. The first step would be to make the present inventory firmer so that the

baseline becomes stronger. It would then be possible to study the total population, its recruitment of additional species - if any, its loss of known species - if any, and the possible encroachment of species of open habitats. It might well be possible to make some university outside of Ghana interested in long-term collaboration in studying the sanctuary. Boabeng-Fiema constitutes a natural laboratory for studies of biodiversity and population dynamics.

As an ecotourism destination Boabeng-Fiema has everything: An interesting historical and cultural background; easy access; highly visible monkeys; relatively plentiful birds; good butterfly watching; amazing ecological contrast between the forest remnants and the surrounding derived savannah; and pleasant, quiet surroundings. Its very presence, and the very good press it receives, encourages tourism to Ghana, even though few may actually visit. However, many tours to Mole National Park now make a detour to Boabeng-Fiema. The sanctuary is also valuable as a showcase of forest habitats to Ghanaian visitors. It is a fine destination for school tours and other types of educational work.

When the author first visited Boabeng-Fiema in 1993, no accommodation was available and a bottle of warm beer could hardly be procured. There is now a rudimentary guest-house and chilled beer is available. However, as with Wli Falls, the forest is so small that its tourist carrying capacity will soon be exhausted.

4.1.4 *BOMFOBIRI WILDLIFE SANCTUARY

Bomfobiri is a small sanctuary of 53km^2 which used to be a mixed habitat of Guinea Savannah, dry woodland, riverine vegetation, and some residual dry semi-deciduous forest. This gave the sanctuary an unusually varied ecological topography. It was first established by the local chief, the Kumawuhene, as the Boufum Forest Reserve – a part of which was then gazetted as a wildlife sanctuary in 1975.

However, Bomfobiri was particularly hard hit by the disastrous bush-fires of 1983 which swept much of the savannah zone. The intrusion of *Eupatorium [Chromolaena] odorata* – aka the Acheampong weed – made the forests particularly vulnerable. As a result the area has now been changed more towards a Guinea Savannah habitat, rather similar to Kogyae and Digya.

The only butterflies known from the sanctuary are those collected during the present mission (4/6 September 2005), with the addition of two or three species seen during the Greentours expeditions (Cardy 2001/2002). The estimated total is 144 species.

Table 4.1.4. Summary of the number of the butterfly species known and estimated in Bomfobiri Wildlife Sanctuary (based on a total of 925 Ghana species as enumerated in Appendix 1a)

Estimated total butterfly species in Bomfobiri W. S.	**144**
Species that have been positively recorded and accepted	60
Species almost certain to occur 95 (75% included in estimate)	71
Species that possibly occur 50 (25% included in estimate)	13
Species that almost certainly do not occur 710 (none included)	0
% of estimated total positively recorded: 42%	

The general impression based on the butterfly fauna is that Bomfobiri emerged from the 1983 fires with the worst of both worlds. The expansion of the savannah habitats have not allowed for the intrusion of the more interesting savannah species while the destruction of the forests have allowed mainly for the survival of the more common and adventive forest butterflies. The savannah butterflies are certainly better conserved in neighbouring Digya and the forest transition zone is better exemplified by the southern parts of Digya. The fact that Bomfobiri has almost as many species as Mole National Park, and more than Gbele, is wholly due to the presence of hardy forest butterflies that do not occur further north.

Apparently some of the larger mammals still exist in Bomfobiri and can be viewed during the dry season, but it can hardly compete with Mole National Park.

4.1.4. The wonderful little waterfall in Bomfobiri, which has many forest butterflies that have survived the 1983 fires in this relatively isolated habitat.

It is doubtful that Bomfobiri makes a major contribution to conservation in general, though there are populations of some major mammals. However, the landscapes are splendid and the little waterfall is beautiful (at least during the wet season). The walk to the waterfall leads through varied savannah country with many fine views and is just the right distance for "adventurous" visitors. Bomfobiri could become a valid component of the Ashanti tourist circuit.

4.1.5 *BUI NATIONAL PARK

Bui constitutes an area of 1,821km^2 mostly consisting of typical Guinea savannah. The main reason for designating the area as a national park was the presence of the largest population of hippopotamus in Ghana. The Guinea Savannah has a spectrum of butterfly species similar to that which is well protected also in Mole, Kogyae, Gbele and Digya. The main special characteristic of Bui is the presence of exceptionally well-developed riverine forests along the Black Volta and its tributaries.

In 1997 the author studied a modest collection of butterflies formed by the Aberdeen University Black Volta Expedition, comprising 43 species. Most of these, as well as an additional 52 species, were collected during the present mission (27/30 September 2005). The visit was during the wet season when access to most of the riverine forest was difficult. The estimated total number of species is 215 but might be higher; the prediction of forest species that could occur is uncertain; true forests are quite far south of Bui. The riverine vegetation in Kalakpa is closer to the existing forests of the Volta Region. Probably the riverine and relict forest of the southern part of Digya is more similar to that of Bui.

Table 4.1.5. Summary of the number of the butterfly species known and estimated in Bui National Park (based on a total of 925 Ghana species as enumerated in Appendix 1a)

Estimated total butterfly species in Bui National Park	**215**
Species that have been positively recorded and accepted	95
Species almost certain to occur 133 (75% included in estimate)	100
Species that possibly occur 79 (25% included in estimate)	20
Species that almost certainly do not occur 618 (none included)	0
% of estimated total positively recorded: 44%	

The only previously known butterflies from Bui are the collection by the - somewhat grandiosely titled - Aberdeen University Black Volta Expedition. Daniel Bennett sent the butterfly collection to the author in London in 1997 for comments (43 species, nothing very special or unexpected). The Aberdeen expedition was assisted in the field by Samson Forgor Mangu. He later became a member of the GWD staff and provided enthusiastic butterfly collecting support in Gbele (Wahabu Base Camp) during the present mission.

Bui, as the last stop on the present mission, gave an opportunity for checking the estimation of likelihood that any given species might occur – the “expected” Bui list had by then been fully worked out. A total of 52 species were recorded in addition to the 43 already known: of these 44 pertained to the category “almost certain to occur”, 4 to the category “possible species”, and only 4 to the category “unlikely to occur”. Just 17 of the previously known species were not re-recorded.

In general the butterfly fauna of the park consists of the usual Guinea Savannah species and of the predictable hardier forest butterflies that also elsewhere penetrate the savannah/forest transition zone. Looking through the list, only three of the forest butterflies are slightly

surprising: *Mylothris schumanni* Suffert, 1904, *Neptis trigonophora* Butler, 1878, and *Coeliades chalybe* Westwood, 1852. Almost certainly more forest species will be found, especially when patches of forest further inside the park are not flooded: it is difficult to predict exactly which. Only one really significant species was found: *Anthene starki* Larsen, 2005. This was described after a series of from Kyabobo (Koue) and is very rare in the Guinea Savannah zone, east to the Central African Republic.

The Black Volta River is scheduled to be dammed in such a way that most of the riverine forest will be flooded and most of the hippo habitats will disappear. An interesting laboratory for the study of riverine forests will disappear, as will one of the most – if not the most – vigorous populations of hippos in West Africa. The suggestion that the hippos might migrate to the Wichiau area of the river sounds quite unrealistic. The dam will not damage any important butterfly populations. However, it is not unlikely that some of the aquatic fauna is of regional importance and would be affected.

The long-term tourism potential of Bui after the dam has been constructed is difficult to gauge. If riverine forest remains on island these might still be attractive as destinations for boat tourism.

Fig. 4.1.5. A small tributary to the Black Volta with a narrow belt of riverine forest that is home to many – but unpredictable – forest butterflies.

4.1.6 *DIGYA NATIONAL PARK

Digya covers 3,478km^2 of mainly Guinea Savannah country, from open grasslands to various woodland formations. Only Mole National Park is larger. Most of the park is very difficult of access and this is especially true for the southern areas, which lie in the forest-savannah transition zone. Because of time constraints only the northern parts of the park were visited out of the Dome and Dadietokro camps, both of which require water crossing.

Before the construction of the Akosombo Dam the Volta River had – sometimes extensive – fringing riverine forest. This was all flooded when the dam was closed. Such vegetation has not and will apparently not regenerate. The naked skeletons of inundated trees still survive after all this time in some areas (see fig. 4.1.6).

No butterflies have previously been documented from Digya. On the present mission just 60 species were recorded. Almost all were typical of the Guinea Savannah – including ubiquitous species – and just a few of the most robust forest butterflies. The estimated total for the park is 189 species. From various reports and conversations with staff it is clear that inland of the lake shores the rivers in the southern parts of the park often have well-developed fringing forests that may have a wider spectrum of species than predicted here. On the assumption that the Bui Dam will be built, southern Digya will be the most important area of forest-savannah transition in Ghana.

Table 4.1.6. Summary of the number of the butterfly species known and estimated in Digya National Park (based on a total of 925 Ghana species as enumerated in Appendix 1a)

Estimated total butterfly species in Digya National Park	**189**
Species that have been positively recorded and accepted	60
Species almost certain to occur 153 (75% included in estimate)	114
Species that possibly occur 60 (25% included in estimate)	15
Species that almost certainly do not occur 625 (none included)	0
% of estimated total positively recorded: 32% *	

* low proportion making total estimate uncertain

No very rare or special species were collected during the mission and generally such species are few in the Guinea Savannah. However, there is no doubt that Digya is one of the best and largely intact areas of the West African Guinea Savannah and that its southern parts show the forest/transition areas at their best. The transition has been poorly studied in all but its botanical aspects. The assistant park manager, Eric Atta-Kusi is currently working on a MPhil. thesis on butterflies at the University of Science and Technology in Kumasi (Dept. of Renewable Resources). The field staff met during the present mission were all enthusiastic about butterfly collecting. The author suggested that a study be made of the differences between the northern and southern limits of the park and has promised all necessary assistance in identification and interpretation which will be aided by the fact that the park headquarters should shortly be on e-mail. It should be possible to develop a detailed scientific

paper over a two-year period. The park manager would like to such a study and it is currently under discussion with Eric Atta-Kusi.

Digya has the potential to become an important tourist destination, especially its southern part and the Apapasu Forest. Even more than Mole National Park, Digya gives the feeling of really being remote from the normal world. Populations of mammals are growing. According to Dowsett-Lemaire and Dowsett (2005) total bird species in Digya is higher than anywhere else. Land based tourism will presuppose a small network of all-season roads in the southern parts of the park.

Water based "adventure" tourism in collaboration with commercial tourist companies should be relatively easy to develop. Good campsites can be developed practically anywhere along the lake and boats can penetrate into quite narrow stretches of creeks and rivers. The possibility of seeing the elusive manatee would always remain a possibility. The author has seen water based tourism in many countries based on a much less promising "raw material" than Digya and Lake Volta.

4.1.6. Remnants of riverine forest that was submerged by the Akosombo Dam. This riverine forest does not seem to be regenerating spontaneously.

4.1.7 *GBELE RESOURCE RESERVE

Gbele Resource Reserve covers an area of 565km^2 of typical Guinea Savannah. A few rivers cross the park. Generally riverine forest is narrow to non-existing, though small pockets occur along the Kulpawn River. The ecology of the reserve is generally more varied in the south (Wahabu Camp visited 23/24 September) than in the north (Gbele Camp visited 26/27 September).

The total number of butterfly species present in the park was estimated to be 127 (table 4.1.7), the lowest for any of the protected areas. The reason is simple: 1) Any traces of the forest fauna are completely missing; 2) Penetration of the disparate Sudanian elements known from Ghana is slight. Thus, the fauna has the "purest" Guinea Savannah composition of any park in Ghana. The author had hoped to find pockets of Sudan Savannah habitats within the park but such do not seem to be present. However, Sudan Savannah butterflies may be found sporadically in the reserve, including some not known from Mole (see discussion on Sudanian elements in Table 3.3.8).

Table 4.1.7. Summary of the number of the butterfly species known and estimated in Gbele Resource Reserve (based on a total of 925 Ghana species as enumerated in Appendix 1a)

Estimated total butterfly species in Gbele Resource Res.	**127**
Species that have been positively recorded and accepted	62
Species almost certain to occur 74 (75% included in estimate)	56
Species that possibly occur 37 (25% included in estimate)	9
Species that almost certainly do not occur 752 (none included)	0
% of estimated total positively recorded: 49%	

Most of the butterflies encountered were ubiquitous or common species of the Guinea Savannah. However, a limited amount of Sudan Savannah elements were encountered. *Euchrysops sahelianus* Libert, 2001 and *E. reducta* Hulstaert, 1924 were both very common, with up to a dozen drinking at nearly any small moist spot. Especially the former tends to be very rare in collections and there are just a few previous records from Ghana (Mole, Bole, Wa, Nakpanduri). A colony of *Colotis aurora evarne* Klug, 1829 was located, the first record from within the protected areas system. There are only sporadic records from the Gambaga area and a single Accra record (the latter blown down on the Harmattan winds). A few *Axiocerses amanga* were another first for the protected areas system, having been caught just a few times in the Wa area. However, the most interesting record was that of *Caprona pillaana* Wallengren, 1857: the single previous Ghana record is from Nakpanduri so the Gbele specimen is by far the easternmost known. The species is also very rare in Nigeria.

The lack of any clear Sudan Savannah habitats, even localized, was something of a surprise. As discussed earlier it seems that at most true Sudan Savannah is only found to the north of Bawku. It would be worthwhile inspecting the few tiny forest fragments north of Bawku near Ghana's northern border; if they do have a true Sudanian character, they should be given good protection as the only such localities in the country [the only practical possibility of seeing

these forests during the present mission was stopped by a thunderstorm that made driving impossible].

Thus the limited butterfly fauna of Gbele does not differ much from that of Mole National Park and the limited amount of Sudan Savannah elements seem to be more prominent in the Upper East Region.

4.1.7. One of the well-maintained boundary lines in Gbele; they make good walks for visitors.

4.1.8 *KAKUM NATIONAL PARK & ATTANDANSO PRODUCTION RESERVE

Kakum/Attandanso covers 607km^2 of moist evergreen forest, most of it in good to reasonable condition. Because of the intensive previous investigations Kakum was not visited during the present mission.

The author began his research project on West African butterflies in Ghana in 1993, when Conservation International was developing the tourist facilities at Kakum. A number of butterfly display cases for the first small museum were made, one of which was given to President Rawlings at the official opening of the park in 1994 (fig. 4.1.8). Since then, more butterfly collecting has taken place in Kakum than anywhere else in Ghana – except possibly the Atewa Range. Virtually all recorded collecting has been by the author, though he was once joined by S.C. Collins, who collected a species new to science (*Cupidesthes pungusei* Collins & Larsen, 2005). The estimated total is 627 species, of which 80% are positively recorded. This figure seems to be fairly characteristic of good forests of reasonable size in the Ghana subregion. Comparable data are not available from the Liberia subregion, but it seems to be about 100 or so species less.

Table 4.1.8. Summary of the number of the butterfly species known and estimated in Kakum National Park and Attandanso Game Production Reserve (based on a total of 925 Ghana species as enumerated in Appendix 1a)

Estimated total butterfly species in Kakum/Attandanso	**627**
Species that have been positively recorded and accepted	493
Species almost certain to occur 136 (75% included in estimate)	102
Species that possibly occur 126 (25% included in estimate)	32
Species that almost certainly do not occur 170 (none included)	0
% of estimated total positively recorded: 79%	

Kakum is a forest with a rich and diverse butterfly fauna. It certainly conserves a large proportion of all Ghana's forest butterflies, including many of the West African endemics. Among the most interesting are: *Cymothoe aubergeri* Plantrou, 1977 is an endemic of the Ghana subregion of Africa west of the Dahomey Gap, otherwise known only from the Bossematié Forest in eastern Côte d'Ivoire; *Euriphene grosesmithi muehlenbergi* Hecq, 1995 is a West African subspecies of a butterfly from the Nigeria/Cameroun area which was collected by the author in Kakum in 1994, before it was described from the Bossematié Forest in Côte d'Ivoire. That both should be known only from Kakum and Bossematié is rather amazing since Bossematié is not far from Bia; *Euphaedra vetusta* Butler, 1871 is extremely scarce in Kakum and in Ghana otherwise known only from the Atewa Range (three specimens); *Celaenorrhinus sagamase* Collins & Larsen, 2005 was caught once in Kakum, the only one apart from the type series from the Atewa Range.

A number of generally rare West African endemic species are also found in Kakum: *Mimeresia semirufa* Grose-Smith, 1902, *M. issia** Stempffer, 1969, *Eresiomera petersi* Stempffer & Bennett, 1956, *Tetrarhanis baralingam* Larsen, 1998, *Cupidesthes jacksoni** Stempffer, 1969, *Bebearia ashantina** Dudgeon, 1913, *Euphaedra ignota** Hecq, 1996, and

*Ceratrichia maesseni** Miller, 1971 (those marked with * are narrowly endemic to the Ghana subregion). Other species also found east of the Dahomey Gap, but everywhere rare, are also found in Kakum: *Argyrocheila undifera* Staudinger, 1892, *Neurellipes fulvus* Stempffer, 1962, *Triclema inconspicua* Druce, 1910, *Neptis mixophyes* Holland, 1892, *Osmodes banghaasi* Holland, 1896, *Osphantes ogowena* Mabille, 1891, *Hypoleucis sophia* Evans, 1937, *Pteroteinon laterculus* Holland, 1890, *Pteroteinon pruna* Evans, 1937, *Leona stoehri* Karsch, 1893, and *Fresna carlo* Evans, 1937. In terms of preserving forest biodiversity Kakum is clearly of supreme importance together with Ankasa and Bia.

A number of species were first described from Kakum though none of these are endemic to the forest: *Hypolycaena kakumi* Larsen, 1994, *Pilodeudorix corruscans kakumi* Larsen, 1994 (originally described as *Diopetes kakumi* but reassigned to a subspecies during a major revision of the groups of related genera and species (Libert 2004)), as well as *Cupidesthes pungusei*. A new genus was also named after the park as *Kakumia* Collins & Larsen, 1998; *K. otlauga* Grose-Smith & Kirby, 1890 is the only West African of three species in the genus.

Fig. 4.1.8a. *Hypolycaena kakumi* at rest. The real head is to the right. To the left the tails and pattern create a realistic false head that make predators attack the wrong end. To increase the effect the butterfly twists around 180 degrees just before landing.

Kakum is the national park in Ghana with most visitors, some 50,000 a year, which is probably more than any other park in West Africa. The marvelous canopy walkway is obviously the main attraction. Unfortunately the Abrafo area is not particularly well suited for butterfly observations by visitors. The forest understory is very dark and tends to be strongly overgrown and the developed tourist circuits hardly have sun penetrating.

The excellent trip reports from the Greentours agency from the UK have commented on the many butterflies coming to the flowers (not least pink *Lantana*) on the walk from the reception centre to edge of the forest on the way to the canopy walkway. During my last visit several years ago other flowers attractive to butterflies were also planted in the visitors' area

by the interpretation centre and the restaurant. The butterflies seen here are mainly common species of farmbush rather than forest butterflies but that would not worry most visitors.

Some of the old logging tracks that can easily be reached our of the Antwikwia Camp could be converted into excellent trails for birding and for butterfly watching, also giving the visitors a stronger feeling of really being “in the forest”. This is also one of the areas where the possibility of seeing elephants is best.

Fig. 4.1.8b. President Rawlings with a case of butterflies assembled by the author at the official opening of Kakum National Park in 1994.

4.1.9 *KALAKPA RESOURCE RESERVE

Kalakpa covers 320km^2 of chiefly Guinea Savannah. Most of the reserve is effectively part of the Dahomey Gap. However, in the north significant areas of broad riverine vegetation, sometimes stretching several hundred metres wide are found, despite the fact that the water courses of the area are of decidedly modest size. So while the visual aspects and the floristic composition is often similar to more northerly savannah areas, the six major riverine forest bands in the reserve ensure the presence of a larger proportion of forest butterfly species The total estimate of 227 butterfly species for Kalakpa is thus much higher than the estimates of 127 in Gbele, 139 in Shai Hills, 144 in Bomfobiri, 149 in Mole, and 163 in Kogyae. Bui – also with extensive riverine forest habitats – probably has 215 species.

No collecting seems to have taken place in the reserve before the present mission, which was assisted by H. Boersma. Four days were spent during September 2005, partly around Zitoe Camp and partly near the Agodake Camp. Though weather conditions were inclement (one day was effectively a washout) 127 species were actually collected, 55% of the estimated total.

Though essentially a savannah area that is located not far from the Volta River, indicator species (*Larinopoda aspidos* Druce, 1890 and *Bebearia cocalia continentalis* Hecq, 1988) show that the butterfly fauna clearly belongs to the Volta region as described in the separate report on the Volta Region (Larsen 2006).

Table 4.1.9. Summary of the number of the butterfly species known and estimated in Kalakpa Resource Reserve (based on a total of 925 Ghana species as enumerated in Appendix 1a)

Estimated total butterfly species in Kalakpa Resource Reserve	**227**
Species that have been positively recorded and accepted	127
Species almost certain to occur 117 (75% included in estimate)	88
Species that possibly occur 48 (25% included in estimate)	12
Species that almost certainly do not occur 633 (none included)	0
% of estimated total positively recorded: 55%	

The butterfly fauna of the Guinea Savannah is typical of this type of habitat and though close to the Dahomey Gap is unlikely to contain many Sudanian elements. Only one of the savannah species was rare: *Azanus natalensis* Trimen, 1887 seems very scarce in West Africa, known from a few collected in Nigeria, two or three from elsewhere in the Volta Region, and two from Gbele National Park (caught during the present mission).

The riverine butterfly fauna is composed of the hardiest forest species known to penetrate such habitats, but with some unpredictable elements that one would not have expected. The total number of forest species much surpasses that observed in Bui National Park. Among the most unexpected were: *Papilio menestheus* Drury, 1773, *Graphium liponesco* Suffert, 1904, *Pentila picena* Hewitson, 1874, *Oxylides faunas* Drury, 1873, *Hypolycaena scintillans* Stempffer, 1957, *Oboronia ornata* Mabille, 1890, *Thermoniphas micylus* Cramer, 1770,

Bicyclus martius Fabricius, 1793, *Ariadne albifascia* Joicey & Talbot, 1921, *Neptis nicoteles* Hewitson, 1874, *Aterica galene* Brown, 1776, *Euriphene ampedusa* Hewitson, 1866, *Acraea jodutta* Fabricius, 1793, *Gorgyra mocquerysii* Holland, 1896, *G. diversata* Evans, 1937, *G. subfacatus* Mabille, 1889, and *Pteroteinon laufella* Hewitson, 1868.

The bird fauna of the riverine forest bands is considered "surprisingly rich" in forest elements by Dowsett-Lemaire & Dowsett (2005). During the dry season larger mammals can apparently be seen with relative ease. The butterfly fauna was decidedly richer than expected and would repay further investigation. The area would be an excellent site for study of the forest-savannah transition.

The reserve must be congratulated for a well-laid network of fine nature trails, as well as a clean boundary line. Both provide useful routes for visitors to explore the area. Many parts of the reserve provide pretty views of the central scarp and views from the Zitoe hill are apparently splendid on good days. The excellent main road makes access from Accra easy and the dirt road to Zitoe Camp can be used by an ordinary car.

The biogeographical importance of the Dahomey Gap is a major selling point for both Kalakpa and Shai Hills,

Fig. 4.1.9. *Acraea umbra* is an example of the true forest butterflies that are found in the riverine vegetation of Kalakpa.

4.1.10 *KOGYAE STRICT NATURE RESERVE

Kogyae is a mainly Guinea savannah area 388km^2 composed of both woodland and more open areas, with a few rocky areas. There are scattered stands of relict forest and some riverine forest, usually just narrowly along actual streams. Some of the relict forests are survivors of the catastrophic fires of 1983 that also affected Bomfobiri, fires that were intensified by the encroachment of the forest understory by the exotic weed, *Eupatorium (Chromolaena) odorata*, which replaced the normal understory of closed and riverine forest. The weed dries during the dry season and it the northern forest zone allows fire to penetrate areas that were previously reasonably safe.

The only butterfly records from the area were made during a visit by the author during 17-21 June 1993. A report was included in the zoological survey by Sam & Wilson (1994). About 50% of the 88 species definitely recorded could be classified as savannah butterflies and another seven percent as ubiquitous species. About 15% are butterflies characteristic of the forest-savannah transition zone (effectively the hardiest forest species). Finally 26% of the species were genuine forest species, a rather large number reflecting the importance of relict and riverine vegetation in the reserve. At the time it was estimated that the total butterfly fauna "is probably not more than 200", which now seems a slightly optimistic forecast. It was not thought useful to revisit Kogyae during the present mission.

Table 4.1.10. Summary of the number of the butterfly species known and estimated in Kogyae Strict Nature Reserve (based on a total of 925 Ghana species as enumerated in Appendix 1a)

Estimated total butterfly species in Kogyae Nature Res.	**163**
Species that have been positively recorded and accepted	88
Species almost certain to occur 81 (75% included in estimate)	61
Species that possibly occur 58 (25% included in estimate)	14
Species that almost certainly do not occur 698 (none included)	0
% of estimated total positively recorded: 54%	

The butterflies collected are generally typical of the Guinea savannah and the forest-savannah transition, and indeed those collected show strong similarity with the samples from Kalakpa, Bomfobiri, Digya, and Bui.

4.1.11 *KYABOBO NATIONAL PARK

Kyabobo is Ghana's most recent national park, situated on and along the mountain range that forms the border between Ghana and Togo in the northern part of the Volta Region. The area covered is 218km^2. The park is contiguous with the Fazao-Malkafassa National Park in Togo, so the total area protected is much larger. At the lowest levels the habitat is pure Guinea Savannah, which becomes increasingly wooded towards the mountains that form a range with several peaks between 700-800m tall. The mountains are a mosaic of dense woodland and forest. The forest is most in evidence along river valley and depressions. In places it forms rather well-developed semi-deciduous forest, especially in the southern parts of the park. However, in general the forests are not as well developed and diverse as those further south, which have now been strongly degraded - very little of these forests in good condition remain and the only protected area is the tiny Wli Falls Nature Sanctuary. In living memory there were extensive forests in the Amedzofe area that contained a population of *Papilio antimachus* Drury, 1782, Africa's largest butterfly.

More detail about Kyabobo is given in a report of the butterfly fauna of Kyabobo and the Volta Region that is a companion paper to the present report (Larsen 2006).

Table 4.1.11. Summary of the number of the butterfly species known and estimated in Kyabobo National Park (based on a total of 925 Ghana species as enumerated in Appendix 1a)

Estimated total butterfly species in Kyabobo National Park	**494**
Species that have been positively recorded and accepted	401
Species almost certain to occur 87 (75% included in estimate)	66
Species that possibly occur 103 (25% included in estimate)	27
Species that almost certainly do not occur 299 (none included)	0
% of estimated total positively recorded: 81%	

The first butterflies from the area around Kyabobo date back more than 100 years when Karsch (1893) listed an impressive 202 species collected in what was then German Togoland. These collecting activities were undertaken from the German base at Bismarckburg, which was close to the southeastern corner of the present park. This was at the time the largest collection to come out from any single locality in tropical Africa. Its composition is analyzed in appendix 2 to the paper on Kyabobo and Volta Region butterflies (Larsen 2006). Though spending more than 20 years in the Volta Region, Father Maessen never seems to have collected in the Kyabobo area. The author was asked to visit the area in 1996 and spent four days in the Shiare area in the south and in Koue in the north, at the time when the area was being assessed for conservation by the Kyabobo Conservation Project. P. Chambers later in 1996 sent a number of small collections from the area, which included some interesting records. Before the present mission it was decided that better data were necessary and R. Vorgas, an experienced local collector, was delegated to visit the area twice during 2005, spending two weeks in the southern parts (some of it just outside the southern park boundary) as well as two weeks in the central areas. His missions were highly successful, yielding more than 300 species. Finally, during the present mission the author visited Koue/Nazani, Pawa

Camp, as well as the area around Odome and the Laboum Valley 20 to 25 August, assisted by H. Boersma as a volunteer.

As a result of these collecting activities 401 species have been positively recorded from the area, with a total estimate of nearly 500 (table 4.1.11). These are very high numbers, considering that the entire Volta Region – which is very well researched – has only 640 species. Thus the positively recorded Kyabobo species cover at least 63% of the Volta butterfly fauna, almost certainly 79%, and perhaps more. However, the data clearly show that many true forest species found further to the south are so far missing and probably genuinely absent. A systematic investigation of the best remaining forests (including the area of the Laboum Waterfalls) might well reveal further butterflies that are not on the list of probable species. Nonetheless, a surprising number of true forest butterflies are found, considering that Kyabobo is further north than any other forests except the impoverished riverine forests of Bui National Park. Dowsett-Lemaire & Dowsett (2005) remark on the richness of the forest bird fauna that practically all observations were "range extensions" to the north (though they do not mention the large collections from Bismarckburg that were discussed in several detailed papers by A. Reichenow between 1891 and 1902).

Karsch (1893) described 17 are valid new species as well as one subspecies from Bismarckburg (effectively Kyabobo). Two additional butterflies have Kyabobo as their type locality: *Iolaus (Etesiolaus) kyabobo* Larsen, 1994 was described from Shiare; the subgenus has since been raised to genus rank. It was originally though to be endemic to the Volta Region, but was found in the Fouta Djalon of Guinea a few years later, and then surprisingly also in the east of the Democratic Republic of Congo. In 1996, the author collected near Koue a good series of what was thought to be *Anthene nigropunctata* Bethune-Baker, 1910, which is surprisingly rare in West Africa. Closer examination showed it to be distinct from the former, which is South African, and it was named *Anthene starki* Larsen, 2005.

The estimated total of 500 butterfly species is clear evidence that Kyabobo National Park is a welcome addition to the protected areas system, the semi-deciduous forest element being the most important.

During the rainy season the mountain ranges of Kyabobo are a beautiful sight from the distance. The dark woodland and forest of the mountain slopes contrasts with the lighter tall-grass savannah. The views can epitomize the desire for undisturbed wilderness. They beckon in the distance, but the role of the park for tourism is faced by a number of constraints. 1) Kyabobo is rather far away from other tourist areas; 2) Access to the most interesting parts of the park remains somewhat difficult, usually involving one or two hours' walk through various types of less interesting farmbush. The tall-grass savannah until about 09.30 retains sufficient morning dew to wet walkers to the skin; 3) During some periods of the year biting insects can be a serious nuisance; 4) Opportunities for seeing large animals of any type are almost absent, though the decrease in hunting may improve on this; 5) There are few outstanding natural features of special beauty or other attraction, though the Laboum Waterfall (not personally visited) would probably qualify.

The park holds little attraction for ordinary tourists without special interests, except for its status as a genuine wilderness. Dowsett-Lemaire & Dowsett (2005) see "little future for birding ecotourism in Kyabobo". Most birders are fixated on seeing as many species as possible and are generally less interested in the ecology and behaviour of their study objects than are other naturalists. All the birds found in Kyabobo can be just as easily seen on the

usual birding destinations, such as Kakum, Atewa Range, Bobiri, Mole, etc. Other naturalists, including butterfly collectors, could spend time in the park in a both pleasant and productive manner, but again practical difficulties are greater than would be the case in many other localities.

The Pawa Satellite Camp has good potential for tourism. The access trek is not too long or difficult and the camp allows visitors to sleep in comfort in the middle of the forest. Camps such as Pawa could also be used for scientific research projects.

Hiking is another tourist possibility where Kyabobo might be suitable. The walk from Koue-Nazani to Pawa is apparently just about right for a day's hike, and it should be possible to reach the Laboum area on a second day. The fact that it would be possible to undertake such a hike without seeing other people at all is a strong point.

The possibility of cooperating with the authorities in Togo on the historical aspects of Bismarckburg might be investigated – this would certainly be an attraction for German tourists.

Fig. 4.1.11. The large and spectacular *Hypolimnas salmacis* is actually one of the more common forest butterflies.

4.1.12 *MOLE NATIONAL PARK

With 4,840km^2 Mole is easily Ghana's largest national park. It is almost exclusively composed of typical Guinea Savannah, with less tendency towards forming closed woodlands than in Digya and Kogyae. Several small rivers have a modest amount of fringing riverine forest, but this is rarely more than a few metres wide.

The author collected in Mole National Park for three days (22-24 August) in 1996 and a brief report was submitted to the Wildlife Department and the park management. J. Ciha collected briefly (21-22 October) in 2003 and Kühne (1999) recorded a number of additional species. Finally a few additional *Charaxes* were added by Joly (2003). Because of the fairly intensive previous investigations Mole was not re-visited during the present mission.

The total butterfly fauna is estimated at 149 species (84 of which positively recorded). The fauna is typical of the Guinea Savannah. Very few forest butterflies occur and only a handful of the Sudan Savannah species were recorded.

Table 4.1.12. Summary of the number of the butterfly species known and estimated in Mole National Park (based on a total of 925 Ghana species as enumerated in Appendix 1a)

Estimated total butterfly species in Mole National Park	**149**
Species that have been positively recorded and accepted	84
Species almost certain to occur 74 (75% included in estimate)	56
Species that possibly occur 37 (25% included in estimate)	9
Species that almost certainly do not occur 730 (none included)	0
% of estimated total positively recorded: 56%	

The most surprising butterflies recorded are *Euphaedra cyparissa* Cramer, 1775 and *E. janetta* Butler, 1871. They belong to a speciose genus of large forest butterflies and are strictly associated with fringing riverine forest vegetation. These species were also found in Bui National Park, but here they fly with an assemblage of other forest species in much better developed riverine forest (see section on Bui NP).

The most notable Sudan Savannah elements are: *Belenois subeida* Felder & Felder, 1865, *Anthene talboti* Stempffer, 1936 (the only known record from West Africa), *Tarucus rosacea* Austaut, 1885 (the only Ghana record known), and *Parosmodes morantii axis* Evans, 1937 (a very rare butterfly in West Africa).

A few very rare butterflies have been recorded: Kühne (1999) found one of just two or three *Kedestes protensa* Butler, 1901 known from Ghana and of which there are at most twenty in collections. Joly (2003) found the rare *Charaxes northcotti* Rothschild, 1899 and J. Ciha collected one of the few *Myrina subornatus* Lathy, 1903 known from Ghana.

Butterfly watching for casual visitors to the savannah areas is generally not all that interesting. Most species are small and population density is low. However – at least at certain times such

as in October – large numbers of butterflies may congregate at damp patches. They range from large swallowtails to somewhat smaller whites and masses of small blues. It should be possible for the staff to keep an eye open for good butterfly aggregations, which will always impress visitors. Large and showy *Charaxes* (perhaps even the two beautiful *Euphaedra*) may be attracted to a simple feeding table where some rotting fruit is placed. They could be placed along the railings near the swimming pool. They should be charged with new fruit daily – the skins of fruit used for breakfast in the restaurant are fine (banana, pawpaw, pineapple), over-ripe bananas are especially good. Once attracted to the fruit the normally very shy butterflies will almost allow visitors to touch them: if chased away they will be back within a few minutes.

Fig. 4.1.12. Two large Charaxes butterflies that could be lured to bait at feeding tables on the lawns of the Mole Hotel. *Charaxes varanes* and *Charaxes epijasius* are both common in the park.

4.1.13 *OWABI WILDLIFE SANCTUARY

This small wildlife sanctuary covers 13 km^2 of dry semi-deciduous forest, some of which is good condition and some in degraded state. Part of the area is composed mainly of a plantation that has been allowed to overgrow. The forest fringes a lake that acts as one of the most important water reservoirs of the city of Kumasi and was made a protected forest reserve. Because of the lake there are also various types of swampy habitats. Till recently Owabi was connected to other forest fragments and semi-forest but these are rapidly deteriorating. Though Owabi will never become as isolated as Boabeng-Fiema its fauna and flora are worth monitoring.

Owabi has been subject to only limited butterfly research. The author collected for a day in September 1977 and again in April 1994; a further visit was paid in October 2005. J. Bossart trapped a modest number of fruit-feeding Nymphalidae, including some not seen on the wing. Though only 144 species are recorded with certainty, the estimated total is 410.

Table 4.1.13. Summary of the number of the butterfly species known and estimated in Owabi Wildlife Sanctuary (based on a total of 925 Ghana species as enumerated in Appendix 1a)

Estimated total butterfly species in Owabi W. S.	**410**
Species that have been positively recorded and accepted	144
Species almost certain to occur 303 (75% included in estimate)	209
Species that possibly occur 231 (25% included in estimate)	57
Species that almost certainly do not occur 247 (none included)	0
% of estimated total positively recorded: 35% *	

* low for purposes of estimation

The species so far known with certainty are mainly the commoner ones of forest habitats; with just 144 many rare species would not have been expected. The acquisition of rare species is very much a function of the time spent in the area. However, in 2005 *Pseuderesia eleaza* was found, This is very rare in Ghana, mainly known from the Atewa Range and the central mountains of the Volta Region. Also evident are a number of *Epitola,* though only two species were collected.

In terms of biodiversity protection Owabi would seem to be a useful, though not critical, component of the protected areas system. However, in terms of other objectives of the Wildlife Division, Owabi has some strong points: a) it provides easy access to attractive and accessible forest in the immediate vicinity of Ghana's second city, Kumasi; b) the central lake is beautiful and peaceful in a way that is not frequent in Ghana; and c) the forest continues to fulfil its role as a protection from the water supply to Kumasi, the reason for which it was originally protected as a forest reserve.

The UK ecotourism firm Greentours visits Owabi for a day as part of its standard 14-day tour of Ghana. The reports on the tours show considerable enthusiasm with the experience. The potential for further development of both local and international tourism is evident.

4.1.14 *SHAI HILLS RESOURCE RESERVE

The Shai Hills consist of a 49km^2 dry savannah area (mostly with shorter grass than the typical Guinea Savannah) not far from Accra. It was originally reserved for game production but also for the conservation of remnants of the culture of the Shai people, who used to live in caves scattered around the reserve. Many savannah mammals thrive in the reserve, including large numbers of baboons that have lost most of their fear of people. The Shai Hills is part of the Dahomey Gap that here swings westwards to reach Accra, where it is replaced by south-east outlier forest towards the western coastline. The nature of the Dahomey Gap is best appreciated when the reserve is approached from the Akwapim Scarp which in recent times was clad in lush semi-deciduous forest. The distance of 25km was sufficient for a complete ecological change though the almost complete deforestation of the scarp now makes the contrast somewhat less vivid.

The savannah is drier than most of the Ghanaian Guinea savannah and even contains some Sudanian elements found only in the extreme north of Ghana. Inside the reserve are fragments of south-east outlier forest which house a number of forest species.

Though the total butterfly fauna is estimated to be only 139 species, its composition is curious, though containing no species that cannot be met with elsewhere in Ghana. The author spent a total of five days in the reserve between 1993 and 1996 (March, April, July, and December). During the present mission in September 2005 Charaxinae were extensively trapped by H. Boersma.

Table 4.1.14. Summary of the number of the butterfly species known and estimated in Shai Hills Resource Reserve (based on a total of 925 Ghana species as enumerated in Appendix 1a)

Estimated total butterfly species in Shai Hills Reserve	**139**
Species that have been positively recorded and accepted	89
Species almost certain to occur 52 (75% included in estimate)	39
Species that possibly occur 44 (25% included in estimate)	11
Species that almost certainly do not occur 740 (none included)	0
% of estimated total positively recorded: 64%	

Most of the common Guinea savannah species are found in the Shai Hills, though some are so far missing (such as *Bicyclus pavonis* Butler, 1876, *B. angulosa* Butler, 1868, *B. funebris* Guérin-Méneville, 1844, and *Astictopterus abjecta* Snellen, 1872). They will certainly be found eventually.

Sudanian elements are on the whole more prominent than in most of the Guinea Savannah. Examples are: *Colotis antevippe*, 1836, *C. evagore antigone* Boisduval, *Belenois gidica* Godart, 1819, *Charaxes viola* Butler, 1865, *Junonia orithya madagascariensis* Guenée, 1865, *J. hierta cebrene* Trimen, 1870, and *Parosmodes morantii axis* Evans, 1937.

In conjunction with the fragments of south-east outlier forest are found a number of true forest species that are not usually found under such dry conditions (such as *Graphium policenes* Cramer, 1775, *Mylothris poppea* Cramer, 1777, *Leptosia wigginsi pseudalcesta* Bernardi, 1964, *Charaxes numenes* Hewitson, 1859, *C. anticlea* Drury, 1782, *Euxanthe eurinome* Cramer, 1775, *Precis pelarga* Fabricius, 1775, *Euphaedra medon* Linné, 1763, *Acraea jodutta* Westwood, 1850, *A. epaea* Cramer, 1779, and *Pyrrhochalcia iphis* Drury, 1773). More will be found. This total assemblage of forest species is not identical with that of the riverine vegetation in typical Guinea Savannah such as the neighbouring Kalakpa.

The fact that Shai Hills are part of the Dahomey Gap could be a useful marketing tool, and the Dahomey Gap and its reflections on the ecology and biogeography of West Africa as a whole should be emphasized in the exhibits of the new Museum.

Fig. 4.1.15. H. Boersma being surprised at the forest butterflies turning up in his traps. The vegetation is of the southern outlier type.

4.1.15 *WLI FALLS/AGUMATSA WILDLIFE SANCTUARY

Wli Falls is a tiny reserve covering 3km^2 of semi-deciduous forest that stretches for some kilometres along a small river, ending in a most attractive waterfall, the tallest in Ghana. Access is by a good, winding path that crosses the river some ten times. A further reason for including Wli Falls in the protected areas system was the presence of a large colony of fruit-bats at the falls. Most of the forest is not in particularly good condition but it still offers visitors a real forest experience in a setting that is among the most attractive in Ghana.

The butterfly fauna was first researched by Father T. Maessen during the many years he was resident in neighbouring Likpe (it was not possible to include all his data in this report as specific Wli records of common species were not recorded). Collectors from the African Butterfly Research Institute, Nairobi have also visited the area. The author spent four full days in the sanctuary during the 1990s and two days during the present mission (September 2005). Some additional data were provided by J. Ciha who collected there on two occasions.

Table 4.1.15. Summary of the number of the butterfly species known and estimated in Wli Falls/Agumatsa Wildlife Sanctuary (based on a total of 925 Ghana species as enumerated in Appendix 1a)

Estimated total butterfly species in Wli Falls/Agumatsa	**503**
Species that have been positively recorded and accepted	326
Species almost certain to occur 205 (75% included in estimate)	151
Species that possibly occur 103 (25% included in estimate)	21
Species that almost certainly do not occur 291 (none included)	0
% of estimated total positively recorded: 63%	

The area is estimated to contain 503 species of butterflies, which is a remarkably high number given that the entire Volta Region has about 640 species. This is much more than in the slightly smaller Boabeng-Fiema Sanctuary with about 350, probably because of the almost complete isolation of the latter. Wli is still loosely linked with the tenuous mosaic of remaining forest in the Volta mountains and has therefore been able to maintain its biodiversity through replacement of species that become temporarily extinct locally - indeed some of the species recorded my not be permanent residents. Most forests in the Volta Region have been destroyed or severely degraded, many quite recently. It is entirely possible that retrenchment of species has led to an increase of butterfly biodiversity at Wli Falls; it is equally possible that future local extinction of species at Wli Falls will no longer be tempered by re-establishment from neighbouring

The sanctuary has two of the seven species that are endemic to the Volta Region (*Papilio nobicea* Suffert, 1904 and *Telipna maesseni* Stempffer, 1970). Four others, *Cephetola maesseni* Libert, 1999, *Iolaus likpe* Collins & Larsen, 2004, and *Iolaus theodori* Stempffer, 1970, and the only known population of *Capys vorgasi* Collins & Larsen, 2004, are from nearby Likpe Mate, ten km to the north.

An interesting species is *Acraea eugenia* Karsch, 1893 – an unusually characteristic member of its genus – which can be abundant in December and January. It may also be common in Kyabobo. Virtually all material in collections is from the Volta Region. Only one record has been traced from Nigeria and only a handful from Cameroun, Congo, and Congo (Zaïre).

Wli Falls is one of the best places in Ghana for visitors to view butterflies, with many large and showy species. The fine central path to the waterfall often teems with them and on hot days large numbers come to mud patches in the clearing next to the falls, sometimes in amazing numbers ("the butterflies were dazzling" says the Bradt Guide to Ghana (Briggs 2004)). During three personal visits, an average of 150 species was seen per day - more than the total in many European countries. The planting of flowers attractive to butterflies, as has been done in Bunso and Bobiri, would enhance butterfly activity in the open rest area in the immediate vicinity of the falls.

It is also clear that the sanctuary is now yielding benefits to the local population. During the past six years three hotels have been built and some local people have been recruited as uniformed tourist guides. Further tourist development will be hampered by the tiny size of the sanctuary, though it may be possible to find alternative patches of forest nearby.

The fruit-bats are being extensively poached, at least partly by hunters from Togo which is very close to the falls. The poachers can be seen climbing the sheer rocks that shelter the bat colonies in full daytimes and they use guns, and this is very off-putting to most visitors (poaching was no evident during the present mission; it turned out that a few days earlier a poacher had fallen from the top of the cliffs and died from a split, but that is hardly a long-term solution to the problem).

Fig. 4.1.15. Forest undergrowth seen from a bridge on the main track at Wli Falls. This is ideal for non-specialist visitors and ends at the lovely waterfall.

Though tiny, Wli Falls is one of the most important localities in the protected areas system. It is one of the most popular attractions for visitors, and rightly so. It has given rise to significant locally based tourist activities that are wholly dependent of the sanctuary. But, despite its small size and far from pristine condition, it is the only protected area with semi-deciduous forest in the Volta Region As emphasized elsewhere in this report Wli Falls should be linked with other remaining patches of forest to assist in preserving the very special fauna of the wettest parts of the Volta Region.

Wli Falls/Agumatsa faces one critical problem. It will soon reach the maximum capacity for receiving visitors. On "good" days even now the number of visitors is so high that the enjoyment of all is diminished. One possible solution is to identify remaining forests in the area around Wli Falls and to enlist these as "satellites" of Wli Falls, to improve tourism and share in the benefits. If such an approach could be set up it would also assist conservation efforts. This would demand an unusual amount of collaboration between the Wildlife Division, forestry departments, NGOs, and local communities – but the benefits could be substantial.

Fig. 4.1.15. The larva of *Euphaedra harpalyce* – very little is known about the early stages of Ghana's butterflies.

4.2 Summaries of other interesting localities (8 locations)

4.2.1 *ABURI BOTANICAL GARDENS

Aburi Botanical Gardens is a small area of just 65 hectares consisting mainly of horticultural parkland, with some scattered shrubbery and a small relict forest at the lower northern part of the forest. The tiny forest fragments are among the few remnants of the once extensive forests of the Akwapim Scarp. There are many old forest trees dotting the extensive and well manicured lawns, which date back a hundred years or so when the site was designated as a sanatorium: the Akwapim Scarp climate was considered to be more bracing and healthy than that of the plains. The gardens are surrounded by the township of Aburi and by agricultural lands. Of all the sites discussed in this report, only the Bunso Arboretum is smaller. The author was led to understand that much of the surrounding land actually belongs to the gardens and is let out on relatively short-term leases.

An initial impression of the butterfly potential of Aburi Botanical Gardens would be negative. In practice a large number of species are present, and in particular the Epitolini tribe of the Lipteninae flourishes because of the large *Crematogaster* ants' nests in the huge old trees that are all over the gardens. Many rare species occur, some of which have yet to be found elsewhere in Ghana. Some of these species have not [yet] been recorded from the protected areas system.

The gardens have been extensively surveyed for butterflies. In addition to the records from the 19th century referred to below, Father Maessen and C. Belcastro collected there, and the author paid more than ten one-to-two day visits during the months of January, April, August, September, October, and December. On most single visits more than 100 species were recorded. Some additional data were recently sent by John Ciha. Because of the intensive previous investigations Aburi was not visited during the present mission. The total butterfly fauna is estimated to be 371 species (including some old records of species that may now be locally extinct); three-quarters of these are confirmed records, a remarkable number for such a small locality with little forest vegetation left.

Table 4.2.1. Summary of the number of the butterfly species known and estimated in Aburi Botanical Gardens (based on a total of 925 Ghana species as enumerated in Appendix 1b)

Estimated total butterfly species in Aburi Bot. Gdns.	**371**
Species that have been positively recorded and accepted	267
Species almost certain to occur 98 (75% included in estimate)	74
Species that possibly occur 118 (25% included in estimate)	30
Species that almost certainly do not occur 440 (none included)	0
% of estimated total positively recorded: 72%	

During the latter half of the 19th century Aburi and the Akwapim scarp was the focus of attempts to grow cash crops on a plantation basis, but did not meet with much success. The present botanical gardens were eventually designated a "sanatorium" for the British colonial

service in West Africa – the climate was considered "bracing" compared to that of the Accra plains. The presence of a European infrastructure also made Aburi an attractive locality for professional collectors of insects. The following butterflies have Aburi as their type locality: *Liptena simplicia* Möschler, 1887 *; *Aphnaeus asterius* Plötz, 1880 *; *Bicyclus istaris* Plötz, 1880 *; *Heteropsis peitho* Plötz, 1880 *; *Eagris denuba* Plötz, 1879; *Eretis plistonicus* Plötz, 1879; *Sarangesa thecla* Plötz, 1879; *Astictopterus anomoeus* Plötz, 1879 *; *Gorgyra aburae* Plötz, 1879 *; *Ceratrichia argyrosticta* Plötz, 1879 *; *Paracleros placidus* Plötz, 1879; *Acleros ploetzi* Mabille, 1890; *Semalea pulvina* Plötz, 1879 *; *Semalea sextilis* Plötz, 1886 *; *Meza meza* Hewitson, 1877 ; *Gretna waga* Plötz, 1886; *Leona luehderi* Plötz, 1879 *; *Gamia buchholzi* Plötz, 1879 *. *Mylothris aburi* Collins & Larsen, 2004 was described from Aburi in respect for its history and continued interest. The eleven species described from Aburi but no longer present are a powerful comment on local extinctions when habitats are destroyed.

Fig. 4.2.1a. *Mylothris aburi* was described from Aburi in 2004 by the author and S.C. Collins (male left, female right).

Fig, 4.2.1b. *Gamia buchholzi*, one of the largest African Hesperiidae, was described from Aburi in 1879 by Plötz.

Euriphene larseni Hecq, 1994 was described after a pair labelled Aburi in the Allyn Museum. This was done without further consultation on the basis of photographs sent for comments by the author, who would have advised a degree caution. The pair almost certainly is mis-labelled specimens of *E. saphirina* Karsch, 1894 from equatorial Africa.

Among butterflies currently found at Aburi are a large number of Lipteninae that are generally rare throughout Africa. Among the more interesting are: *Liptena tiassale* Stempffer, 1969 (known only from the type locality in Côte d'Ivoire and from Aburi, where numerous), *Iridana incredibilis* Staudinger, 1891, *I. nigeriana* Stempffer, 1964, *Cerautola crowleyi* Sharpe, 1902, *Geritola virginea* Bethune-Baker, 1904, *Stempfferia staudingeri* Kirby, 1890, *Cephetola collinsi* Libert & Larsen, 1999, and *Neaveia lamborni* Druce, 1910.

With its proximity to Accra Aburi Botanical Gardens, with its residential facilities and good restaurants, is a small jewel of a nature reserve. It is deserving of longer-term development. If more of the present park area were allowed to become wilderness rather than being ruthlessly maintained as short-cropped grass, biodiversity would be increased. Apparently a large area of adjacent land currently used for agriculture actually belongs to the gardens. Some of this should be allowed to regenerate as forest. It was also been suggested (Chief J. Moxon, pers. comm.) that part of the area should be devoted to a theme park where the mainstays of Ghana's agricultural crops can be seen by visitors with appropriate explanations of their cultivation, harvesting, processing, and end use. The author agrees with Chief Moxon that Aburi could become a major international tourist attraction with relatively small investments.

4.2.2 *ATEWA RANGE FOREST RESERVE

The Atewa Forest Reserve covers 232km^2 of forest, moist evergreen and semi-deciduous at lower levels and upland evergreen forest at the higher levels (700m+). It is one of just two major areas of upland forest, the other being at Tano Ofin [there appears to be third very small fragment of upland forest also on the Kwahu Plateau]. At the foot of the range there are stretches of farmbush, some of which degraded to the point of being derived savannah. In zoological and botanical literature the locality is often given as "Kibi", the main town at the foot of the range. Atewa is classified as a GSBA (Globally Significant Biodiversity Area).

The flora is rich contains several endemic species, as well as tree-palms and a species of *Rubus* allied to those of the East African mountains and not found in other West African forest types. At least 200 birds occur, of which ten are globally-threatened (Dowsett-Lemaire & Dowsett 2005). The butterfly fauna contains an estimated 700 species (572 actually recorded), by far the highest for anywhere in Ghana - or for that matter West Africa as a whole.

The butterflies of the Atewa Range have been extensively collected during the past 70 years. Most importantly, much of the collecting of Father Theodor Maessen outside of the Volta Region took place at Atewa between 1932 and the 1970s. His immaculate collection is well housed at the Allyn Museum of Entomology (formerly in Sarasota, now in Gainesville (Florida)). M. Usher also collected frequently on Atewa (Usher 1979, 1980a, 1980b, 1984, 1985, 1986). Between 1977 and 1996 the author spent about ten full collecting days on the range, covering the months of January, March, April, September, and October. Material was also collected during the 1990s by Major T. Helps. During the past six years collectors for the African Butterfly Research Institute have continued collecting in the area: most of their material has been seen by the author. This intensive study has led to 80% of the estimated total actually having been collected (the same proportion as for Kakum and Kyabobo). Because of the intensive previous investigations, Atewa Forest was not visited during the present mission.

Table 4.2.2. Summary of the number of the butterfly species known and estimated on the Atewa Range Forest Reserve (based on a total of 925 Ghana species as enumerated in Appendix 1b)

Estimated total butterfly species on Atewa Range	**697**
Species that have been positively recorded and accepted	572
Species almost certain to occur 134 (75% included in estimate)	100
Species that possibly occur 101 (25% included in estimate)	25
Species that almost certainly do not occur 118 (none included)	0
% of estimated total positively recorded: 82%	

The extremely rich butterfly fauna of Atewa contains a number of species worthy of special mention. First among these are the endemic *Mylothris atewa* Berger, 1975, which is sometimes quite common. It belongs to a large and complex genus but is most distinctive and does not have any evident close relative anywhere. A second endemic is and *Anthene helpsi*

Larsen, 1994 [in the description one is mentioned from Côte d'Ivoire, but this is now believed to be a mistake]. This cream-coloured butterfly is allied to the rare *Anthene scintillula aurea* Bethune-Baker, 1910 that also occurs on Atewa but which is structurally very distinctive. The species seems to be exceedingly scarce - only five specimens are known. These two butterflies must have evolved during dry periods when the forests of upland Atewa were wholly surrounded by savannah country, which has happened on several separate occasions during the Miocene, Pliocene, and Pleistocene (the last such episode was no more than 12,000 years ago (Maley 1996). They may be survivors of a larger upland element; most likely *Uranothauma belcastroi* Larsen, 1997 on the Nimba Mountains area was once on Atewa as well.

Another interesting and significant species is *Acraea kraka kibi* Usher, 1986. This is a subspecies - clearly distinctive, but not sufficient to merit the specific status accorded by Usher - of *A. kraka kraka* Aurivillius, 1893 which is a rare submontane butterfly of the Nigeria/Cameroun Mountains. This is also found on Tano Ofin, the only other upland forest in Ghana. A close parallel is found in *Acraea translucida* (aka *A. penelope derubescens*) which is a largely submontane butterfly known from the Nigeria/Cameroun mountains, the central mountains of the Volta Region (especially the Amedzofe area), and the Atewa range. In long series the Nigeria and Ghana populations do not seem to differ subspecifically. Neither is found west of Atewa. Their presence in Ghana reflects a period when climates were wetter and cooler and the Dahomey Gap was fully forested.

Atewa has a population of the magnificent *Papilio antimachus* Drury, 1782 whose wing-span can be up to 25cm, the widest of any butterfly in the world. The wings are very narrow and other butterflies surpass it in wing surface. The only other Ghana records traced are from Amedzofe in the Volta Region and from Atewa [in January 2006 a male was unexpectedly collected at Bobiri by an inexperienced collector, possibly a stray from Atewa]. The former population now appears to be extinct and the rather extensive forests below Amedzofe have largely been destroyed. The species is, however, still present on Atewa and has been found on at least five occasions during the past five years - but it is rarely seen except when coming down to drink from the edge of streams since it stays in the canopy. It is found in most of the African forest zone without forming subspecies, but is generally very scarce in West Africa. It was first described from Sierra Leone in 1782: it was to be 200 years before next specimens from Cameroun reached museums in Europe.

Very many rare species are known from Atewa, about 60 recorded from nowhere else in Ghana - at least so far – and about 90 not recorded in the three main National Parks (Ankasa, Bia, and Kakum). Ten endemics of Africa west of the Dahomey Gap are among them. To list all species that are considered rare would take up too must space. One good example is *Mimeresia moyambina* Bethune-Baker, 1925: it was described from a single male from Moyamba in Sierra Leone about 100 years ago. In 1966 a few were found in Côte d'Ivoire, then another in 1997. That year three were caught by collectors from ABRI on Atewa, including the first ever female. Among other species endemic to West Africa found on Atewa and not known from elsewhere in Ghana are: *Papilio rileyi* Berger, 1950, *Pentila petreoides* Bethune-Baker, 1915, *Ornipholidotos issia* Stempffer, 1969, and *Liptena griveaudi* Stempffer, 1969. In all, ten West African endemics are known from Atewa and nowhere else in Ghana. Also known in Ghana only from Atewa are the equatorial species *Ornipholidotos irwini* Collins & Larsen, 1998, *Abisara gerontes* Fabricius, 1781, and *Abantis ja* Druce, 1909. However, perhaps the rarest and most surprising of all is the recently discovered of *Charaxes fournierae jolybouyeri* Vingerhoedt, 1998. The species is most unusual and the Ghana

subspecies differs strongly from the nominate, the closest populations of which are in Cameroun (it has since been found also in upland Guinea near Nzérékoré). Joly (2003) considers this species on its own to justify conservation measures for Atewa, which was considered strongly threatened habitat.

Mention should also be made of *Anthene atewa* (Larsen & Collins, 1998). It was collected by the author in the very same spot where the type of *Anthene helpsi* Larsen, 1994 was found but is also found sporadically in other wetter parts of Ghana and Côte d'Ivoire. In the recent book on West African butterflies (Larsen 2005a) *Celaenorrhinus sagamase* Collins & Larsen, 2005 was described (named after the village of Sagyamase at the foot of Atewa); this species was found in Kakum in 1993, but must overall be very rare.

Fig. 4.2.1. *Papilio antimachus* – Africa's largest butterfly – Is still found on the Atewa Range but is vulnerable to deforestation. It is probably now extinct in the Amedzofe area of the Volta Region where it was found in the 1960s. This is a large male; unusually the female is smaller.

The very high level of biodiversity, the presence of endemic species, the presence of many species known from nowhere else in Ghana, and the pan-African rarity of many of those present combine to indicate that the conservation importance of the Atewa forests is of the highest priority – possibly the most important site in the country, and certainly the most important area without formal status as a protected area. It is therefore extremely worrying – even scandalous – that it has not proved possible to stop continued, extensive, organized illegal logging. A sharp increase in the protection of the Atewa forests is an urgent need.

The Atewa Range soils are rich is bauxites, the raw material of aluminum. The deposits more or less cover the exact area of the most valuable forests. Whether mining will ever be an economical proposition seems uncertain. The biodiversity value of the forest should be strictly protected in case of exploitation.

To the above should be added that Atewa is one of the most beautiful areas in Ghana. The views towards the Kwahu Scarp are magnificent, the climate is distinctly cooler than in the surrounding lowlands, and the area has the potential to be turned into an ecotourism centre of world class. And contrary to many of Ghana's natural history attractions the Atewa Range is situated within easy access of both Accra and Kumasi. In countries like Costa Rica or Malaysia a location like Atewa would almost certainly long since have been converted to a tourist resort with the main - though not only - emphasis on people attracted to nature.

4.2.3 *BOBIRI BUTTERFLY SANCTUARY

Bobiri Butterfly Sanctuary is a small semi-deciduous forest of 21km^2. The forest is in fair condition, with patches of secondary forest and abandoned farmbush, as well as some swampy areas. It was and remains an experimental forest used by the Forest Research Institute of Ghana (FORIG) and has an old established guest-house at its centre. Some years ago it was designated as a butterfly sanctuary. With the help of USAID and the Peace Corps trails were created and the extensive gardens planted with "butterfly-friendly" plants. The author is widely quoted as having stated that 400 species of butterflies occur at Bobiri, though he never visited the area.

On the present mission H. Boersma from Holland volunteered to spend 14 days at Bobiri to conduct a butterfly survey (1-15 September 2005), assisted by the author for two days. In addition, butterflies of the Charaxinae were trapped by Joly (2003) and the fruit-feeding Nymphalidae by Bossart (pers. comm.). A few additional species were accepted from reports by Cardy (2001/2002).

The weather during the main survey period was inclement, so the total of 220 species actually collected by our team was fairly satisfactory.

Table 4.2.3. Summary of the number of the butterfly species known and estimated in Bobiri Butterfly Sanctuary (based on a total of 925 Ghana species as enumerated in Appendix 1b)

Estimated total butterfly species in Bobiri Butt. Sanct.	**483**
Species that have been positively recorded and accepted	232
Species almost certain to occur 253 (75% included in estimate)	190
Species that possibly occur 245 (25% included in estimate)	61
Species that almost certainly do not occur 195 (none included)	0
% of estimated total positively recorded: 48%	

The estimate of the number of species at Bobiri is 483. Since only half of these have yet been collected, the true total is probably more than 500. Boersma extensively trapped members of the Charaxinae as did Joly (2003). Between them they collected 31 of the 50 known Ghana species (62%). A few additional species may yet be found (see Appendix 1b). This provides additional support for an estimate of more than 500 species in all. The Bobiri butterflies will eventually be the subject of a joint scientific paper co-authored with H. Boersma to provide an authoritative basis for further research on this interesting forest.

The fauna is typical for the type of semi-deciduous forest of the sanctuary. No truly outstanding rarities have yet been found though this might well happen. However, three of the well-studied Charaxinae are definitely rare: *Charaxes hildebrandti* Dewitz, 1879, *C. zelica* Butler, 1869, and *C. mycerina* Godart, 1824. Just before closing the report an e-mail arrived from J. Bossart recording a specimen of *Celaenorrhinus ankasa* Larsen & Miller, 2005 from a banana-baited trap [identification confirmed by J. Rawlins, Carnegie Museum]; this is only the fourth specimen known, the others being from the Atewa Range and Ankasa. Many other

species are indicators of forest of good quality. While this report was being finalized two young Danish entomologists visited Bobiri and found *Papilio antimachus*, the only Ghana record from outside the Atewa Range in recent memory. Bobiri can probably be considered an important protected area, though not managed by the Wildlife Division.

On the internet a Google search for "Bobiri" results in 417 hits and it is becoming increasingly well known. The guest-house is used by several ecotourism ventures (including Greentours of UK). It is also the base of a long-term butterfly study conducted by Professor Janice Bossart from the United States. She annually spends two months in the sanctuary together with one or two graduate students. Many organized tours stop at the sanctuary as part of their itinerary, that of Greentours in UK spending several nights there as a base for trips to Owabi and Bomfobiri.

The author concurs with the opinion of Joly: "The initiative to designate the area as a butterfly sanctuary would thus appear appropriate" (Joly 2003). It is a good example of kind of ecotourism sites that widens the attractive choices of visitors to Ghana - even though the number of actual visitors may not yet be very high.

It should be possible to develop Bobiri to a real centre for international research into the ecology and behaviour of tropical butterflies, as well as to increase its ecotourism potential. In order to assist in this, H. Boersma and the author plan publish a separate, detailed account of the Bobiri butterflies as a typical example of the forest fauna in Ghana.

Fig. 4.2.3. Sign in the excellent butterfly garden at Bobiri. Nobody actually know how many butterflies there were, but it now seems closer to 500 (see table above).

4.2.4 *BUNSO ARBORETUM AND BUTTERFLY SANCTUARY

The Bunso Arboretum is a tiny area of just 16.5 hectares, most of which carefully tended gardens and some cocoa plantations. Just a small area is forest in good condition; this was seen mostly in poor weather and yielded relatively few species of closed forest. Most of the immediately surrounding forests have been cut. During an afternoon and a morning on the present mission 71 species were recorded. There are probably less than 250 species in the area, which is not much by forest standards. No rare or unusual species were observed.

Table 4.2.4. Summary of the 'guesstimate' of species occurring and known from Bunso Arboretum (based on a total of 925 Ghana species as enumerated in Appendix 1b)

'Guesstimate' of total butterfly species in Bunso Arboretum	**200-250**
Species that have been positively recorded and accepted	71
% of estimated total positively recorded: 30%	

Part of the gardens has been planted with shrubs that attract the largest and more showy of those butterflies that are present and they do fulfil this purpose well. Many large swallowtails (Papilionidae) and whites (Pieridae) visit the flowers from early morning till late afternoon. There is no actual information about butterflies in the arboretum office, but they do have some general books.

Fig. 4.2.4. The beautiful palm avenue leading to the guest house at the Bunso Arboretum. The special "butterfly garden" is on the immediate left.

During the visit we witnessed an educational session for two classes from private junior secondary schools, which were good on facts and delivered in a way that the young people could understand. In some respects this kind of educational activity may be best handled by small sites like Bunso.

There is a beautifully situated old guest house on a hill in the centre of the grounds. It is a pleasant site that attracts a number of individual visitors as well as tour groups. We were well received and looked after by Ben Sakyi who also acts as guide for natural history excursions by schools. The arboretum is one of those small localities that adds to the variety available to tourists in Ghana and it is well covered on the internet and in guide books. It is in all a most pleasant locality. However, it has little value for nature conservation.

4.2.5 *CAPE THREE POINTS FOREST RESERVE

Cape Three Points covers 51km^2 of moist evergreen forest, a narrowly distributed forest type that bridges the wet evergreen forest (like Ankasa) and the moist evergreen forests further north and west. It is the only evergreen forest almost to reach the coast. The forest is known to have an interesting flora scoring high on the "genetic heat index". The forest reserve was therefore upgraded to a GSBA (Globally Significant Biodiversity Area), an action further justified by its being in better condition than most of Ghana's forest reserves. Encroachment, logging, and even poaching seems to be at low levels and the local communities seem to take pride in 'their' GSBA – specially in Tumentu Village the chief, Nana Azia-Ntoa III, has ensured local volunteer participation in an active Community Biodiversity Advisory Group (CBAG).

The forest lies on a ridge that stretches almost north-south between the main Takoradi-Côte d'Ivoire highway and the lighthouse at Cape Three Points, the southernmost part of West Africa. The highest point is 480m, high by Ghana standards, but not sufficient for the development of upland forest.

The author collected briefly from the western (lighthouse side) on 16-17 January 1994 from where access to the forest is not easy. During the present mission the eastern slopes were visited from the village of Tumentu 12-15 October, though under indifferent weather conditions. Collectors from the African Butterfly Research Institute, Nairobi have visited the area on a few occasions, but over time notes were only made on some of their most interesting records.

A total of 537 butterfly species are estimated to occur in the area, but due to the limited amount of field-work the estimate still remains somewhat weak/low. Since only the most interesting/rare ABRI captures figure on the list, common species are underestimated and the true total should be higher, probably slightly more than 600.

Table 4.2.5. Summary of the number of the butterfly species known and estimated in Cape Three Points Forest Reserve (based on a total of 925 Ghana species as enumerated in Appendix 1b)

Estimated butterfly species in Cape Three Points FR	**537**
Species that have been positively recorded and accepted	174
Species almost certain to occur 418 (75% included in estimate)	313
Species that possibly occur 201 (25% included in estimate)	50
Species that almost certainly do not occur 131 (none included)	0
% of estimated total positively recorded: 32%*	

* low proportion for estimates

Among interesting sp are *Iolaus banco* Stempffer, 1966, which has so far only been found in a few localities in Côte d'Ivoire, including the Banco Forest in the suburbs of Abidjan. *Mimeresia issia* Stempffer, 1969; *Tetrarhanis baralingam* Larsen; 1998; *Anthene atewa* Larsen & Collins, 1998; *Charaxes hadrianus* Ward, 1871 (see fig. 4.2.5b); and *Cymothoe*

weymeri mulatta Belcastro, 1990 are all rare species of the wetter forests. *Neptis mixophyes* Holland, 1892 was more common on the eastern slopes in January, 1994 than it has ever been recorded anywhere in Africa. *Catuna niji* Fox, 1965 is a very local West African endemic that was unknown in Ghana till collected by the author at Ankasa in 1993 (now also known from Krokosua Hills and Tano Ofin). *Euriphene leonis* Aurivillius, 1898 is known from just a few old Ghana specimens in the Natural History Museum, London (see fig. 4.2.5b). *Celaenorrhinus leona* Berger, 1975 is a rare West African endemic and *Abantis leucogaster* Mabille, 1890 is rare on a pan-African basis.

Fig. 4.2.5a. The almost surgically clean boundary line of Cape Three Points GSBA.

Fig. 4.2.5b. Top: *Charaxes hadrianus*, Bottom: *Euriphene leonis*.

The chief of Tumentu hopes that it will be possible to develop cultural and nature tourism in the area. Since Tumentu is just off the main road from Takoradi to Ankasa and Abidjan, this is not an impossible ambition. Virtually all crops of the forest zone are available in the village (palm-oil, rubber, coconut, cocoa, and their processing can be displayed). The forest is rich in birds and butterflies. Views from the forest edge are in places spectacular, and the contrast between the forest edge and plantation or farmland is quite spectacular (fig. 4.2.5a).

4.2.6 *GAMBAGA ESCARPMENT

The Gambaga Escarpment in northern Ghana consists of a low scarp stretching some 60km, more or less west-east from the main Tamale-Bolgatanga Highway to Nakpanduri on the border with Togo. Where not cultivated, the vegetation is mainly relatively typical Guinea savannah, with dense woodland/forest fringing any rivers in the area, especially the Volta River system. Nonetheless, over time the area has produced a number of butterfly species that are mainly associated with the Sudan Savannah habitats further north. The visit to Gambaga, and areas further north, was mainly undertaken to investigate whether there might be pockets of land that supported Sudan Savannah butterflies, about which little is known in Ghana.

Gambaga was the location of an agricultural research station during colonial times and a good deal of butterflies from the area may be found in the Natural History Museum, London. Some material from Nakpanduri collected during brief visits by Father Theodor Maessen is found in Florida; notes were taken of seemingly significant specimens. Collectors from African Butterfly Research Institute, Nairobi (ABRI) also collected briefly at Nakpanduri. The author visited Nakpanduri/Morago East Forest Reserve 18-21 October 1995, and a few spots between Nakpanduri and Gambaga were also sampled. During the present mission, the author visited the Gambaga Scarp, Gambaga East Forest Reserve, Nakpanduri/Morago East Forest Reserve, and the area around Hunters' Camp on the Volta River (Red Volta East Forest Reserve) (18-21 October 2005) – coincidentally on the very same dates as eight years ago.

Table 4.2.6. Summary of the number of the butterfly species known and estimated in Gambaga Scarp (based on a total of 925 Ghana species as enumerated in Appendix 1b)

Estimated total butterfly species on Gambaga Scarp	**168**
Species that have been positively recorded and accepted	91
Species almost certain to occur 89 (75% included in estimate)	67
Species that possibly occur 40 (25% included in estimate)	10
Species that almost certainly do not occur 705 (none included)	0
% of estimated total positively recorded: 54%	

The butterflies of the Gambaga Escarpment are generally typical of the Guinea Savannah. Even the densest woodland/forest fringing the Volta River contained no true forest species. There is, however, an admixture of Sudan Savannah elements of the type that are not resident in parks such as Bomfobiri, Digya, Kogyae, and Bui, or even Mole (see table 3.3.8). These elements occur only erratically and no concentrations of them were found. It is just possible that some true Sudan Savannah habitats occur around and to the north of Bawku, but weather during the day this area was prospected was impossible for butterflies. Sudan Savannah butterflies are also encountered sporadically in the Wa and Lawra areas, and to a lesser extent in Gbele National Park.

Mention should be made of one notable species of the Gambaga Escarpment: *Pyrrhiades lucagus* Cramer, 1777, a large blue hesperiid that is the only member of its genus and endemic to West Africa. It is quite common and there are specimens from seventy years ago in museums. Otherwise the species is limited to the narrow belt of southern outlier forests

from Liberia to Ghana, but not crossing the Volta River. The Gambaga population is thus completely disjunct from the southern population (the only exception seems to be a single specimen collected at Bomfobiri during the present mission).

The parts of Gambaga East Forest Reserve and the Nakpanduri/Morago East Forest Reserves that are lying on the actual scarp command some truly magnificent vistas towards the north and, during the rainy season, are beautifully green (see photo below). The dense vegetation along the Volta River near Hunter's Camp is interesting, and there are one or two minor waterfalls in the area. Birdwatching is good and there is a clear tourist potential. Hiking holidays could be very attractive.

Fig. 4.2.6. View to the north over the Volta River from the Gambaga Escarpment. The small concentrations of woodland/riverine forest that can be seen have virtually no forest butterflies. This stunning vista is only available on good days during the wet season. During most of the dry season there is much dust in the air and when the "harmattan" is active, there is no view at all.

4.2.7 *KROKOSUA HILLS FOREST RESERVE

The Krokosua Hills Forest Reserve consists of 482km^2 of moist semi-deciduous forest that has been classified as a GSBA (Globally Significant Biodiversity Area). It does not score high on the "genetic heat index". The forests are located on a narrow rocky ridge, which set it apart from the neighbouring Bia National Park. Its butterflies were studied for two days in 2000 as part of the review of the butterflies commissioned by the Protected Areas Development Programme for Western Region (PADP) under the then Ghana Wildlife Department (Larsen 2001) and then again for six days in 2003 as part of the Conservation International Rapid Assessment Programme (Larsen 2005b). Some additional scattered data were also obtained (C. Belcastro, T.B. Larsen, K. Aduse-Poko). It was accordingly not visited during the present mission.

Large parts of the reserve have been logged, and illegal logging is apparently still taking place. Poaching is a major problem. During the Rapid Assessment Programme in 2003 the numbers of primates were found to be grievously low and no credible data on the presence of the red colobus monkey were obtained. Some rare small mammals were found.

A total of 626 butterfly species are estimated to occur in the area, but due to the limited amount of field-work the estimate is somewhat weak.

Table 4.2.7. Summary of the number of the butterfly species known and estimated in Krokosua Forest Reserve (based on a total of 925 Ghana species as enumerated in Appendix 1b)

Estimated total butterfly species in Krokosua Hills F. R.	**626**
Species that have been positively recorded and accepted	202
Species almost certain to occur 533 (75% included in estimate)	399
Species that possibly occur 101 (25% included in estimate)	25
Species that almost certainly do not 89 (none included)	0
% of estimated total positively recorded: 32% *	

* low for purposes of estimation

No very rare or really exceptional butterflies have been found in Krokosua, but a number of interesting species do occur, including some not found in Bia [it should be noted that the record of *Euriphene leonis* Aurivillius, 1898 as new to Ghana by Larsen (2005b) was based on an unusual aberration of the common *E. ampedusa* Hewitson, 1866]. Nonetheless, some rather scarce species are found on the main rocky scarp and more are likely to be found. This includes one unidentified member of the Lycaenidae (tentatively called *Triclema krokosua*) which cannot be formally described till more material is available.

Among the interesting species are *Dixeia capricornus* Ward, 1871, *Charaxes hildebrandti* Dewitz, 1879, the West African endemic subspecies of *Cymothoe herminia gongoa* Fox, 1965 and *Cymothoe weymeri mulatta* Belcastro, 1990, *Bebearia demetra demetra* Godart, 1824, and the Ghana Region endemic *Euphaedra mariaechristinae* Hecq & Joly, 2003.

Though further collecting will doubtless reveal more rare and interesting butterflies, the Krokosua Hills are unlikely to be a conservation priority for butterflies.

Access to the hills are rather difficult, especially taking into account the excellent access to Bia National Park. However, the mountain ridge is an interesting feature and the relatively short walk from the village of Mmem across the ridge is both interesting and pleasant.

Fig. 4.2.7a. Poacher in Krokosua Forest Reserve with Maxwell's duiker.

Fig. 4.2.7b. Two rare butterflies Top: *Cymothoe herminia gongoa*. Bottom: *Euphaedra gausape*.

4.2.8 *TANO OFIN FOREST RESERVE

The Tano Ofin Forest Reserve consists of 413km^2, of which 12% is classified as a GSBA. The forest is mainly moist evergreen to semi-deciduous forest, but it contains the second-largest of the two major areas classified as upland evergreen forest by Hall & Swayne (1976, 1981), the other being the Atewa Range (see section 4.2.1). A few tiny fragments of this habitat may also still be found on the Kwahu Plateau. The condition of the forest is very variable; some areas are well preserved, others have been heavily logged and encroached upon, while yet others are still being illegally logged and encroached upon. Initial reports from the study of GSBAs by the Institute of Renewable Natural Resources, University of Science and Technology, Kumasi are not positive on present protection standards.

Table 4.2.8. Summary of the 'guesstimate' of species occurring and known from Tano Ofin Forest Reserve (based on a total of 925 Ghana species as enumerated in Appendix 1b)

'Guesstimate' of total butterfly species in Tano Ofin	**620-650**
Species that have been positively recorded and accepted	199
% of estimated total positively recorded: 30% +	

During the present visit only two days were spent in the Tano Ofin area and the best quality patches of forest were evidently not reached. However, in recent years collectors from the African Butterfly Research Institute, Nairobi (ABRI) collected extensively in Tano Ofin. It was not possible for the author to monitor systematically all the incoming material, though many of the more significant species were enumerated. The material included most of the usual common forest butterflies, which it was not possible to include in the list in appendix 1b. K. Aduse-Poko (Institute of Renewable Natural Resources, University of Science and Technology, Kumasi) trapped fruit-feeding butterflies in the area as part of a study of GSBAs and his records are listed as well. Overall, the available data from Tano Ofin give the impression that the area is rich, diverse, and with many rare species. Though the 199 species are listed from Tano Ofin in appendix 1b are too few for a formal estimate of the total, an informed guess would be a total butterfly fauna of 620-650 species.

Among particularly interesting butterflies are: *Acraea kraka kibi* Usher, 1986, a subspecies endemic to Ghana and otherwise known only from the highest parts of the Atewa Range, being a specialist of the upland evergreen forest; *Liptena seyboui* Collins & Larsen, 2004, a West African endemic that is otherwise known only from eastern Côte d'Ivoire; *Aphnaeus charboneli* Bouyer & Libert, 1996, a species described from a few Cameroun specimens and otherwise known only from Tano Ofin; and *Abantis tanobia* Collins & Larsen, 2005, a Ghana endemic recently found also in Bia National Park (three of these are shown in fig. 4.2.8).

As discussed in section 4.2.1 on the Atewa Range, the upland evergreen forests are of great ecological importance, yet exist in only two major localities. This alone makes the safekeeping of the Tano Ofin area important, including the lower forests that provide a buffer and protection for the upland forests and that have an interesting fauna of its own. However, a survey of the upland evergreen forests needs to be made in order to see if special protection here is needed.

Tano Ofin is relatively difficult of access and probably has little immediate value for tourism. However, its upland evergreen forest urgently needs protection and the lower parts of the GSBA would add a further repository and stepping-stone in the conservation of the moist evergreen forests.

Fig. 4.2.8. The three most interesting butterflies known from the Tano Ofin Forest Reserve. Left: *Liptena seyboui*; Centre: *Acraea kraka kibi*; Right: *Abantis tanobia* (see above).

5. PUBLICITY, TOURISM, RESEARCH, AND INCOME

5.1 Introductory remarks

The mission statement of the Wildlife Division (bottom of this page) is quite clear that the major objective is the preservation in perpetuity of the natural ecosystems existing in Ghana as well as their attendant flora and fauna. This is a basic responsibility to the people Ghana now and in future generations. It is also an international obligation. A special emphasis is placed on those species that are "rare, endangered endemics, and species of high conservation interest". Chapter 3 of this report draws conclusions on this issue using butterflies as an indicator group and the generally positive conclusions are summarized in section 3.5 and in the concluding remarks following that chapter, as well as in the Executive Summary.

The author does not have the data or the experience to comment on the role of the protected areas system in its role to "protect and maintain ecological and life-sustaining processes such as catchments protection [and] soil conservation". Many of the forest reserves in southern Ghana were in fact created with such objectives in mind and that accounts for many of those recently designated as GSBAs. Of course, the Owabi Wildlife Sanctuary owes its existence to the water reservoir.

Most of this chapter will deal with recreation, tourism, research, income-generation, and publicity aspects of the protected areas system. During the mission it was not possible to approach these issues in a structured manner, so the treatment is of necessity somewhat impressionistic.

"Wildlife Division Mission Statement"

The Wildlife Division will work effectively with others to ensure sustainable management of Ghana's wildlife and their habitats, so as to optimise their contributions to national socio-economic development.

Objectives for protected areas

To preserve examples of natural ecosystems representative of those occurring in Ghana.
To conserve sites of biological importance and natural scenic beauty.
To ensure that viable populations of all indigenous wild species including passage migrants are adequately conserved and that rare, endangered endemics and species of high conservation interest are specially protected.
To protect and maintain ecological and life-sustaining processes such as catchments protection, soil conservation and genetic diversity.
To provide opportunities for research, education, recreation and tourism.
To generate economic activities in and around protected areas and promote the sustainable use of wildlife.
To protect and maintain cultural resources."

5.2 Publicity

During the present mission the author came across the following two pictures. They could not be found on the internet. They were not seen at the Wildlife Division Headquarters, nor was reference to them made anywhere else in Ghana.

a) The Mole swimming-pool elephant: The wonderful picture below shows an elephant drinking from the swimming-pool at the Hotel in Mole National Park. It was sent to the author by Malcolm Stark of the Ghana ecotourism firm, "A brush with nature". He had used it to make a T-shirt that he gave to participants in some of this Ghana tours. If well used, a picture like this could be worth tens of thousands of dollars to the Ghana tourist industry and assist in strengthening support for conservation in Ghana, and by implication support for the Wildlife Division.

Fig. 5.2.1. An elephant having an early morning drink from the swimming-pool at the hotel in Mole National Park (the photo is copyright of Sylvester Kubu and should not be reproduced without his permission).

b) The Digya Manatee: The West African manatee (*Trichechus senegalensis*) is generally considered to be an endangered species. Its presence in the Lake Volta system has even on occasion been doubted. At some time in 2004 or 2005 the Wildlife Division sent out a "wanted poster" for the manatee. One day a message arrived at the Digya National Park headquarters in Atebubu that villagers near the park had caught a manatee. A staff member jumped on a motorbike and the following photograph ensued.

Fig. 5.2.2. A manatee collected in Lake Volta by fishermen from the opposite shore of Digya National Park. The animal was in good condition and subsequently safely released back in the lake.

The entire story is hugely compelling. Information about an endangered species is circulated to local communities with a request that information is given to the Wildlife Division. One is caught by a local fisherman. The information is given to the national park. Instead of ending in the pot, the manatee is released into its natural habitat. Wide publication of the story would be a boost to conservation and to the reputation of the Wildlife Division, inside Ghana and internationally. The photograph was sent to headquarters in Accra, but does not appear to have been put to any use. Some mechanism for publicity is evidently needed.

The Wildlife Division needs a structured – but not necessary complex – publicity strategy to support its integrity and to assist in the accomplishment of its mission statement. Among the aims would be:

- increase awareness in Ghana concerning conservation purposes and priorities
- support the role of nature and ecotourism as part of Ghana's tourist policies
- secure continued interest and support of conservation donors
- improve Ghana's participation in international research
- enhance the visibility and highlight the successes of the Wildlife Division
- motivate the staff of the Wildlife Division
- motivate existing Community Biodiversity Advisory Groups

As mentioned above, making use of such opportunities is not necessarily complex, but it would need to have specifically assigned responsibility at the Wildlife Division headquarters, or the responsibility will fall between chairs.

An example of good publicity for butterflies in Ghana downloaded from the internet concludes this chapter (section 5.10).

5.3 Tourism and ecotourism

Some of the protected areas system sites have become significant tourist destinations. Kakum National Park must be the most important park in all of West Africa in terms of visitors. Numbers of visitors were growing fast even before the construction of the canopy walkway, which is by any standards a spectacular attraction. It was conceived as one of the three components of tourist development in the Central Region under the CEDECOM "master plan" of beaches, heritage, and nature. Mole National Park has a fair amount of visitors, many of whom pay to stay in the Mole Hotel. Here the presence of elephants is a major attraction – it is the only accessible place in West Africa where visitors can be fairly certain of seeing elephants without too much determination. Both have been the subject of considerable investment. Both remain important for nature conservation.

However, the tiny Wli Falls Wildlife and the even smaller Boabeng-Fiema Nature Sanctuaries also attract many tourists. The Wli Waterfall is beautiful and the walk there just the right distance for visitors not wishing to endure excessive hardships. Butterfly watching can be dazzling and the fruit-bat colony never ceases to amaze. The number of visitors have spawned a local hotel "boomlet" that provides income to many people. The history of the monkeys at Boabeng-Fiema, and the way in which they can be observed even without binoculars, make the sanctuary an exciting place to visit. The Owabi Wildlife Sanctuary has a small network of fine paths as well as some fine views of the reservoir. Its closeness to Kumasi makes it particularly appropriate for school visits and local tourism (the author was actually taken there during a demographic conference in Accra in 1971). None of these reserves plays an important role in conservation, but they are good value in highlighting the mission on the Wildlife Division.

It is not the role of the Wildlife Division to become a tourist agency, but it is its role to provide options for the tourist industry to exploit. Judging from the amount of entries on the internet, tourist companies have enthusiastically seized on the five protected areas mentioned above. The various NGO or community-based nature sanctuaries (often based on traditional sacred groves) are also well covered. The publicity activity of the Wildlife Division must also include the tourism industry (see section 5.2).

Many of the tourist attractions in Ghana can hardly be described as major by any standards, nor do they have many visitors. However, their very presence – the fact that they are there as options – are part of the framework that makes Ghana an attractive tourist destination. For instance, the waterfall in the central area of Bomfobiri is a little jewel that awaits the visitor at the end of a relatively easy trek through dry savannah country. There are a number of other pretty waterfalls dotted around Ghana, often with a bit of forest attached. Thus both Fuller Falls and Kintampo Falls receive a fair amount of visitors.

To some extent the ecotourism industry is based on attracting visitors from abroad. However, experience from other countries shows that with increasing urbanization and better educational standards, local tourism will become more important. Up to 20 years ago in India, the idea of visiting "remote", "uncomfortable", and even "dangerous" places with snakes and creepie-crawlies was considered a strange concept. Nature conservation had little resonance among the electorate. Today, the national parks in India are crowded with Indian visitors and conservation is backed by millions of well-educated Indians. Plants, animals, and nature in general are deeply ingrained in the cultural heritage of most ethnic and cultural groups in Ghana. In the not too distant future Ghanaians will be more important for tourism than will foreigners. Yet unborn Ghanaians will be very angry if they cannot see the natural heritage of their country.

5.4 Use of mass media

Ghana has a wide range of mass media (newspapers, magazines, television, radio, internet, etc). Some are fairly sophisticated, some less so. All desperately need good copy concerning any issues relating to Ghana. Setting up a service to distribute items – such as the two photos shown above – via e-mail with attachments would be very easy. A report like the present one could be sent as a one page capsule, with some good pictures.

It could be made a fixed part of the TORs of consultants also to produce a small press release at the end of their missions. The author would have been happy to write a few items.

Ghana's butterflies all present and correct in our National Parks

The main conclusion of one of the world's leading experts on butterflies finds that most of the 900 Ghana butterfly species are present within the 15 parks managed by the Wildlife Division of the Forestry Commission. Dr. Torben B. Larsen travelled extensively throughout Ghana to reach this promising conclusion …

….. etc.

If you need further information, additional pictures, or wish to see the report, contact the Wildlife Division …… etc

In 1999 a beautiful 50-minute video was published by Cinebutterflies (Banks 1999), a first for Africa. The title was **GHANA'S OTHER GOLD**. Most of the footage was shot in Kakum National Park and at Wli Falls. In the credits the Wildlife Department is profusely thanked. John Banks sent two copies to Ghana in a special format suitable for TV-broadcasting, but does not know for certain whether they were ever broadcast. Such a film could easily be broadcast once a year, occupying a splendid hour of airtime on TV at no cost to the broadcaster. And it **can** be re-broadcast: no lesser authority than Sir David Attenborough says: *This is a rich video that merits repeated viewing*. Sir David's own programmes certainly are broadcast again and again!

Regular positive exposure in the mass media can increase the support for and interest in conservation, in addition to providing a better understanding ecology and biodiversity. It should be possible to manage such exposure at little cost.

5.5 Scientific use of the protected areas system

Around the world there are many research centres run by universities and scientific institutions, usually jointly between foreign and local agencies. There are several in Latin America in collaboration with American universities (Panama, Costa Rica). The Wau Institute of Ecology, which is under the auspices of the Bishop Museum in Hawaii, has a long track record as a base for natural history research, as well as for TV programmes. A few places in Africa have such institutions: at Lamto in Côte d'Ivoire, in the Kibale Forest in Uganda, and in the Usambara Mountains in Tanzania.

Ghana is ideally placed for the scientific study of tropical ecosystems and their fauna. The ecology is varied; English is widely spoken; visitor safety is high; competent local assistants can be found; etc. For the past six years Prof. Janice Bossart (currently of the University of Louisiana) has used the Bobiri Butterfly Sanctuary as a base for various butterfly studies by herself and her graduate students. They have recently used about half the available accommodation for two months of the year. It should be possible to develop this kind of "scientific tourism". The forests and savannahs of Ghana are rich in flora and fauna, the country has an enviable reputation as a friendly, decent, and safe country, and of keeping red tape at reasonable levels. English is spoken right out in the remotest corners of the country. Transportation is well developed. The potential for developing one or more field research stations is definitely present, also within the protected areas system (Bia and Ankasa already have some of the necessary facilities). Among the potential benefits are:

- Improved knowledge of the Ghana flora and fauna.
- People on the ground will deter poaching.
- Participation of Ghanaian scientists and students.
- Closer ties with universities and research institutions overseas.
- Income from employment of local staff, accommodation, and food.
- Greater recognition of Ghana and its scientific inputs.

5.6 Collecting policies

Since 1993 the Wildlife Division has had a liberal attitude towards the collecting of plants and insects for scientific and amateur-scientific purposes. In 1996 the author led a butterfly collecting tour from the United States including 14 people, which resulted in the first detailed checklist of all Ghana butterflies (Emmel & Larsen 1997). Such liberal policies should be continued. The most frequent collectors would be those of butterflies and moths. There is also a community of beetle collectors, specializing in just a few families. Such collectors usually have some scientific interest in the groups they collect. Most of their material will eventually end in public museums or universities. Collectors of other arthropod groups will usually be scientists or amateur-scientists. In most cases the material collected has no commercial value – in fact the people involved usually spend considerable amounts of their own money.

All species of insects are present in so large numbers that casual collecting will make no dents in total populations. Many rare species are rare mainly because they have life-styles that make them difficult to find even by scientific collectors. Even a narrowly endemic species such as *Mylothris atewa* Berger, 1970 is probably frequent enough to withstand any likely amount of collecting – and there is no commercial market for this rather small species which looks like dozens of other *Mylothris*, and hundreds of other Pieridae.

The number of known butterflies in Africa over the past 20 years has grown from 3,600 to 4,000 – some because revision work on a large scale was undertaken, some because new species were collected in the field. The vast bulk of the tens of millions of insect specimens in museum and university collections has been provided by amateurs and general collectors ever since the 18th century. There is no reason that this should be discontinued. Probably nine out of every ten insects found in Ghana are not yet known to science; unless they are collected and end up in collections available for specialist study, they never will be known.

A few butterflies and beetles do have a significant monetary value. However, the market is small. As soon as large numbers of any given species are in stock internationally, prices drop precipitously. One Ghana species that would probably fetch a significant sum on the international market is *Charaxes fournierae jolybouyeri* Vingerhoedt, 1998: the species was first collected in Ghana in 1997, then also in Guinea and Côte d'Ivoire in following years. The fact that this spectacular butterfly escaped notice till so recently indicates that it is very unlikely that any collector will come across it – and that over-collecting would be almost impossible.

During the past 15 years constraints have increasingly been placed on the collecting, and thus study, of insects. In some cases they have reached farcical levels. A few years ago in the Philippines, a group of scientists from a European country were arrested in Palawan for capturing a small amount of forest mosquitoes. They were trying to make a DNA database of species that were not yet known to be vectors of human diseases, though other members of their genera were such vectors. They had tried for two years to get official permission, but never had a reply, and then decided just "to do it". Their ambassador had to come down from Jakarta and it took two weeks to get team released. While this was happening, Manila was in the grip of dengue fever: newspapers, radio, and TV were covering the city with advice on hundreds of ingenious ways of killing as many mosquitoes as possible!

5.7 Staff development

One of the most valuable assets of the Wildlife Division is its staff. Some have good knowledge on some aspects of natural history. Many are interested to know more about the natural history of the area in which they work. It is sometimes difficult to escape the impression that senior staff believe that knowledgeable staff may be a threat to their authority. That is a narrow view indeed. Knowledgeable staff are an asset to managers: staff should be made more knowledgeable and managers should see them as a strength and take pride in them.

At the headquarters of the Wildlife Division there should be an assigned responsibility for ensuring that the headquarters of all fifteen protected areas get copies (two for staff will small

staff, more in others) of all press releases and reports of general interest and of all reports specifically dealing with their area.

Since most staff will come to the park headquarters from time to time, a small area of shelving should be available for an extra copy of all such documents so that they can be read at leisure. Ideally, such a "resource corner" should also include a copy of available field guides such as exist for birds and mammals.

Dowsett-Lemaire & Dowsett (2005) were generally hesitant to accept records of birds recorded by wildlife staff. In one location they found a staff member with such knowledge that many of his observations of birds not seen by them were included on their species list. They were so impressed that they gave him a field-guide and expressed the hope that he could get a pair of binoculars (the author gave him his own battered pair). This man would be able to gain invaluable systematic information on breeding seasons without prejudicing his official duties.

Guides have little understanding of what might interest visitors. This is hardly surprising: they already know their environment and cannot really appreciate how other people do not. Guides usually do not have the luxury of large mammals or spectacular birds that are readily visible with which to impress visitors. But visitors are grateful to be shown and told of smaller things. Examples from a basically endless list are given below: small single-page fact sheets on such issues could be prepared and discussed at staff meetings for issues that are specific to one locality (hippos in Bui, manatees in Digya).

- medicinal plants – most visitors will be fascinated by any medicinal plant, which complaints it is used for, which parts are used, and how it is prepared
- giant snails – seeing giant snails, learning about their cooking, and the fact that they have become agricultural pests in Hawaii and Mauritius will not fail to impress
- shea butter – how it is harvested, processed, and used will be quite new to most visitors
- driver ants – are among the most fascinating creatures of the forest with up to ten million in a column, workers and soldiers, egg and grubs being carried, etc. etc.
- chamaeleon – any guide who can show visitors a chamaeleon in the wild will be popular with any visitor
- agamid lizards – the head-nodding of the red-headed males is for the establishment of territory
- guineafowl butterfly – the resemblance between butterfly and bird is amazing and the butterfly can be followed along tracks for long distances (see fig.3.3.4.1)
- scorpions – seeing a scorpion in life, and perhaps photographing it, could end up as being one of the best memories taken back from a visit to Ghana
- crayfish – in some places crayfish can be seen swimming in streams (e.g. Ankasa); most visitors have eaten them but never seen them
- shrike larders – shrikes often spear beetles and grasshoppers to eat later, a most amazing sight that will thrill any visitor
- etc … etc … etc … the list is endless

In 1998 the author was taken by a technical assistant, whom he did not know, to be shown a very special butterfly. It turned out to be the false-head butterfly (like *Hypolycaena kakumi* in

fig. 4.1.8a). He had enjoyed showing it to visitors, especially the way it turned 180 degrees just before landing to confuse predators. What he did not know was that he was faithfully repeating part of a butterfly training course organized by the author for staff in Kakum in 1994. He had not participated in that course, but a colleague that had showed him the butterfly in nature. Even informal communication can work!

5.8 Book on Ghana butterflies

Butterflies feature strongly in the guidebooks and tourist information about Ghana. Yet no information on African butterflies is available from any bookshop in Ghana. It is the author's intention to research the publishing a small book "Butterflies in Ghana" through an established publisher with an existing distribution network in-country. It would not – could not – be an identification guide, but it should allow the reader to know roughly what type of butterfly he/she sees. It would link butterfly distribution in Ghana with the protected areas system. However, the emphasis would be on using butterflies as the subject of biodiversity and ecology in a way that is understandable to any reader. The book should be available for sale also by the Wildlife Division.

5.9 Income-generation from butterflies

A question often asked is if butterflies can be used for income-generation. The answer is yes – but in a limited manner that needs good planning and marketing. The most realistic option is possibly the production of boxes with samples of the Ghana butterfly fauna, much like the one given to President Rawlings in 1994 (fig. 4.1.8). The author's views have not changed much since 1994 when the following notes were included in a report to IUCN (Larsen 1994):

> "National conservation policies need broad political support. The establishment and maintenance of national parks demand the understanding and the cooperation of the people living in proximity of or in the parks. This implies that the national parks' system must be perceived as at least as good a use of the land as alternative uses. Increasingly, it is accepted that - up to point - conservation must pay its way, and that the people living near or in the parks must benefit directly.
>
> Butterflies, as a renewable resource, have the potential to provide income for a number of local communities. The potential must not be exaggerated, but nor should it be discounted. It has not, as part of this exercise, been possible to undertake the necessary market research and production costing for such activities. It is probable that a well-managed butterfly project could turn over $ 150,000 or more, most of which would go towards producing an income for the collectors. While this is not much seen in terms of the GNP, it would be a very large sum for a number of rural communities.
>
> Though estimates are difficult to make, a sober 1983 assessment by the National Research Council in USA reached a figure of US $ 10 - 20 million for the worldwide butterfly trade; it would probably be higher to-day.
>
> Sustainable collecting of butterflies
>
> Butterfly collecting on the scale demanded by potential butterfly projects in Ghana does not pose a risk to the butterfly populations - with the possible exception of one or two very rare species that can be trapped.
>
> *First*, most of the butterflies collected will be males, since this is the active sex. Many come to damp patches where they are most readily collected, but where females are never seen.

Males of all species can mate several times, while females only need to mate once to fertilize all their eggs. Even if a large proportion of males were removed from the population, it is still unlikely that many females remain unmated.

Second, most of the butterflies have very large populations, though they fluctuate seasonally. Some of the more common species exist at an average density of a minimum of one per 100 m^2; in a forest such as Kakum-Attandanso this means that the population is of at least 1.7 million individuals.

Third, large parts of most of the forests are trackless and virtually impenetrable and would no be visited by collectors.

It is important that any forest products - including butterflies - are provided with labels explaining that they are products of sustainable use, designed to assist in the protection of natural habitats.

Potential types of butterfly projects

The butterflies of Ghana could potentially provide the basis for income and employment in a number of ways:

Ecological tourism is a growth sector in the low-volume high-cost tourist industry. Butterfly collecting tours are organized to many parts of the world, not least to Costa Rica and Ecuador. The fauna makes such tours to Ghana of great potential interest and I have been approached by two tour operators with a view to organizing such a tour. I would seem worthwhile to test-run a tour in collaboration between a travel agency in Ghana and one abroad. The market in birdwatching is probably larger than that of butterfly collecting.

Research activities in butterflies are an important component in biology, entomology, population biology, evolution, and other studies, not least at North American universities. Many of these are conducted at ecological field stations in Latin America. Forests in Ghana are very suitable for such studies. It is probable that one or more small ecological field stations, meeting basic criteria (electricity for computers and catering possibilities are important), could be operated at a profit. Such field stations would obviously not be limited to butterfly research. The type of structure that has been built at Boabeng-Fiema could be used partly as a field station.

Butterfly marketing can take several different guises:

1) There is a market in Europe, Japan, North America, and South Africa for good quality specimens of all species. The butterflies are stored in small paper triangles. About a thousand would fit in a container the size of a shoe-box. Certain groups of large and showy butterflies are in demand by specialist collectors and on average fetch higher prices. There would need to be technical assistance with training and with setting up the network of dealers abroad, as well as financing for the initial shipment charges.

2) The production of display boxes with large, showy, or interesting butterflies for sale to visitors to the parks, and in souvenir shops in major cities, would be relatively easy to set up. Test-marketing would quickly produce an impression of the size of the total market and the desirable price levels to maximize income to the local communities.

3) Pictures made from butterfly wings are sold throughout Africa from sources in the Central African Republic and obviously produce sufficient income to permit a sophisticated distribution system. Possibly some group of craftsmen in Ghana might be interested in the concept, initially for the local market. They are not to everyone's taste, but they would not constitute a danger to butterfly populations.

4) Butterfly houses, where large tropical butterflies are displayed live under 'natural' conditions, are becoming increasingly popular. They began in the UK, spread to continental Europe and North America, and are now flourishing also in the Far East. They have a continued need for butterfly pupae, which need to be shipped by airfreight, since the pupal stage lasts only 14 days. Butterfly houses are very competitive and take pride in displaying

species that have not been 'shown' before. A steady supply source of African butterfly pupae would have an assured market.

General prerequisites for success:

1) There needs to be a firm management structure with adequate supervision and technical assistance.
2) There has to be a *proper marketing structure* and a balance of supply and demand, an area which many such small-scale projects have failed adequately to provide for.
3) There has to be a *stability of supply*, or the wholesalers and retailers will lose interest.
4) There has to be an *adequate level of quality control*, so that the products do not deteriorate when the level of technical assistance needed is scaled down". (Larsen 1994)

5.10 A local article on butterflies from the internet

It was interesting to find this article on the internet. The author has evidently gone to considerable trouble to research the topic, and many of the issues raised in the present report are covered. This kind of person might well be willing to collaborate with the Wildlife Division on publicity in exchange for "scoops" – for example and interview with someone like the author.

Let's Exploit Our Butterflies as Ecotourism Product

by Richard Kwame Debrah (Aug. 2003)

The butterfly is fast emerging as one of the leading ecotourism products the World over.
Many people travel to visit butterfly gardens far away from their homes or Countries to view and photograph beautiful butterflies across the World. While some butterfly lovers just want to have a close look at them either in flight, or study their wings as they perch on flowers busily sucking nectar, others collect different sizes, and species and make collages of them and mount exhibitions for auction sales or just display them in their living rooms and even their offices. Today, textile designers study patterns on butterfly wings and replicate them on fabrics.

In the Western Countries,, people hold butterflies in their palms at wedding ceremonies say their wish for the newly wedded and release the butterflies. They believe that the butterflies carry the wishes to God. Recently in Costa Rica, members of parliament took part in butterfly release as part of a fund raising event for street children. As each legislator release a butterfly, he would call out loud the name of a child. The butterfly he released represented the life and aspirations of that child. One could perceive the collective hearts of those present fly up with each passing butterfly.

Interest in the Lepidoptera became serious business for many people in the Western world during the Victorian era, roughly 1860-1910. At that time, members of the English aristocracy, endowed with wealth and leisure derived from the United Kingdom's flourishing empire collected and identified and catalogued Lepidoptera from all over the world. At one point, Lord Rothschild employed over 400 explorers and colonists all over the World collecting butterflies on his behalf. Lord Rothschild's butterfly collection is regarded as the single largest personal collection of butterflies ever.

Since the Victorian era, butterflies have been the subject of great interest for thousands of biologists and amateur enthusiasts. Today, there are hobbyists particularly in the United Kingdom and the United States of America who rear butterflies from around the World
in their backyards.

Butterfly exhibition is another fast growing industry. Everyday of the year witness a butterfly exhibition somewhere in the World. In America, the Niagara parks commission's butterfly garden is a 15 million US dollar facility and was opened in December, 1996. During one weekend in January, it received 20,000 visitors.

In Ghana's traditional folklore, butterflies represent inconsistency probably due its quick flight from flower to flower. A person who is a flirt may easily be referred to as a "butterfly". Butterflies occur at several places in Ghana which include the Hohoe area, near the Wli water falls, Bobiri in the Asante Region, Atewa hills in the Easter Region, Kakum forest in the Central Region and Ankasa in the Western Region and many other locations but in smaller numbers.

The potential of Ghana as good butterfly viewing and collection destination is not a joke, when our varieties of species are considered. Dr. Torben Larsen (butterfly scientist) counted 400 species of butterflies at Kakum in 1992, and discovered the "*Diopetes kakumii*" a new magnificent butterfly hitherto unknown to science. Ghana is also home to the male giant Papilio (Papilio Antimachus), the second largest butterfly in the world which can attain a wing span of 10.5 inches. The female can attain 7 inches. Papilio is found in the Atewa hills in the Eastern Region. Other species in Atewa which are of global importance because of their high endemic status are the *Acraea kibi*, *Mylothris atewa*, and *Celaenorrhinus sagamase*. They are mostly concentrated at Sagyimase where they are being collected under the guise of scientific research.

This writer has been to Atewa and Wli to view butterflies and can testify that rare and amazingly beautiful species of these winged jewels inhibit our sunny rainforest canopies, feeding on nectar-filled flowers growing many metres above ground level. They only come to earth when the canopy dips into river channels or natural openings or they have to be attracted by other means, and the butterfly garden is what does the trick. A typical butterfly garden is a half-acre of land; it may be bigger or otherwise. It is not capital intensive, can be cultivated at the edge of the forest by creating conditions that will attract these magnificent insects. When butterfly gardens are cultivated at the edge of forests, access to the forest is somehow restricted thus reducing human impacts on the forest. Protecting the environment while generating income from it is the spirit of all ecotourism projects. Butterfly gardens are a delight to see.

Most butterfly garden projects are community based. They focus on poverty alleviation through employment generation for community folks. There are several of such projects in Papua New Guinea, Costa Rica and several other places across the World. There are a few taking shape in Ghana at Bobiri in Asante Region and another by the Ghana Wildlife Society in the Volta Region. The income generating ability of the butterfly does not lie only in the butterfly garden but also in the export of butterfly pupae.

The Papua New Guinea butterfly industry fetches 400.000 US dollars annually, with a pair of *Ornithoptera paradisea* 100 US dollars. The *Ornithoptera alexandrae* which, the rarest and largest butterfly in the World which can attain a wingspan of 27cm attracts a retail price of 500 US dollars. The good news is that the World's second largest butterfly, the *Papilio antimachus* is found in the Atewa forest of Ghana around Sagyimase together with several other species. The Sagyimase butterfly sanctuary is yet to be exploited to the advantage of the surrounding Communities. The butterflies and the Communities are waiting for the district assembly or any investor ready to go into partnership with the people.

Tourism business is not government business it is a private sector business, governments just make legislation and policies and ensured they are adhered to. Let us therefore not wait for a presidential initiative on butterflies. Let the district assemblies and the communities get together, and take advantage of the butterfly resource in a viable Community based ecotourism venture.

The butterfly gardens will bring these winged jewels of the tropical rain forest closer and concentrated at specific locations which will attract domestic and international tourists.

As tourists come, there will be the need for ecolodges (guest houses), guides for bush walks, entertainment groups, and refreshment centers, food preparation and craft shops. These ventures would bring money in to the pockets of folks in the attraction areas. This is how ecotourism can transform the economic lives of poor communities. And with each visitor comes another economic reason to maintain our rainforests.

Views expressed by the author do not necessarily reflect those of GhanaHomePage.

6. CONCLUDING REMARKS

The author has had the privilege of studying the butterflies of Ghana for well over ten years. This report concludes that on the whole the protected areas system protects the fauna and flora well, though the forest components are on balance too small in size and should be expanded. At the risk of repetition, the urgency of including the Atewa Range as a fully protected area cannot be exaggerated. A formal protected areas system can do only so much: forests in good condition of any type ought to be conserved as well as possible – be they forest reserves or sacred groves. Some of the forests designated as GSBAs do have active Community Biodiversity Advisory Groups (CBAG) – they really needs to be encouraged in a flexible and informal manner.

During the late 1960s the author collected extensively in the dry forests of Olokemeji and Ilaro in western Nigeria. They were the driest type of specialized semi-deciduous forest close to the Dahomey Gap in Bénin. Their flora and fauna were of great interest. The forests are no more: they were illegally cut down during the early 1980s and are now ecological desert. In the Zoological Museum, University of Copenhagen are housed under good conditions several thousand butterflies from there, all of them well labelled. Each of these is effectively a FOSSIL ON PIN.

Let us hope that the remaining natural habitats in Ghana will not be remembered though a long series of “fossils on a pin”. Let us hope that they will remain as a natural heritage that gives pleasure and inspiration to the people of Ghana, that will allow visitors from abroad an insight into tropical biodiversity, and that will permit scientists to study and describe the hundreds of thousands of organisms in Ghana that are as yet unknown.

REFERENCES:

This list of references contains those quoted in the report as well as many of the published papers dealing specifically with the Ghana butterfly fauna.

BAKARR, M., BAILEY, B., BYLER, D., HAM, R., OLIVIERI, S., & OMLAND, M. 2001. *From the forest to the sea: biodiversity connection from Guinea to Togo. Priority-setting workshop, December 1999*. Conservation International, Washington DC.

BANKS, J. 1999. Ghana's other gold [video on butterflies]. Pemberton Books & Cinebutterflies, UK.

BRIGGS, P. 2004. *Ghana - the Bradt travel guide*. Bradt Travel Guides, UK.

CARDY, P. 2001/2002. Ghana Butterfly Special. A Greentours trip report (2001/2002) (computer printout).

COLLINS, S.C., LARSEN, T.B. & WARREN-GASH, H. 2004 [2003]. Notes on Afrotropical butterflies with the description of eleven new species and four new subspecies. (Lepidoptera, Rhopalocera). *Metamorphosis*, 14:63-110.

DAVENPORT, T. 1996. The butterflies of Uganda – an annotated checklist. Forest Department, Kampala, pp. 1-48 (computer printout.

DOWSETT-LEMAIRE, F. & DOWSETT, R.J. 2005. Ornithological surveys [in many protected areas and additional localities published separately]. Wildlife Division & IUCN, Accra.

EHRLICH, P.R. & HANSKI, I. (eds). 2004. *On the Wings of Checkerspots: A Model System for Population Biology*. Oxford University Press, Oxford. 408pp.

EMMEL, T.C. & LARSEN, T.B. 1997. Butterfly diversity in Ghana, West Africa. *Tropical Lepidoptera*, 8 (supplement 3):1-13.

HALL, J.B. & SWAINE, M.D. 1976. Classification and ecology of closed canopy forest in Ghana. *Journal of Ecology*, 64:913-951.

HALL, J.B. & SWAINE, M.D. 1981. *Distribution and ecology of vascular plants in a tropical rainforest: Forest vegetation in Ghana*. W. Junk, deen Haag.

HEWITSON, W.C. 1874. A list of butterflies taken on the march to Coomassie .. by A. S. Bell ... between Mansu and the river Prah ... new species. *Annals and Magazine of natural History*, (4) 13:380-383.

HOWARD, P.C., VISKANIC, P., DAVENPORT, T.R.B., KIGENYI, F.W., BALTZER, M., DICKINSON, C.J., LWANGA, J.S., MATTHEWS, R.A. & BALMFORD, A. 1998. Complementarity and the use of indicator groups for reserve selection in Uganda. *Nature*, 394 (6692):472-475.

JOLY, C. 2003. Contribution à l'étude des Charaxinae du Ghana (Lepidoptera: Nymphalidae). *Notes faunistiques de Gembloux*, 50:27-47.

KARSCH, F. 1893. Die Insekten der Berglandschaft Adeli in Hinterlande von Togo (Westafrika). *Berliner entomologische Zeitschrift*, 38:167-266.

KÜHNE, L. 1999. Contribution to the Lepidoptera-Fauna of Ghana - Part 1: Results of the expeditions 1992-1997 (Lepidoptera, Papilionoidea, Hesperioidea). *Esperiana*, 7:399-424.

KÜHNE, L. 2001. Contribution to the Lepidoptera-Fauna of Ghana - Part II: The butterfly collection of the Department of Zoology in Legon, University of Ghana. *Esperiana*, 8:637-648.

KÜHNE, L., COLLINS, S.C. & KINUTHIA, W. 2004.Check-list of the butterflies of the Kakamega Forest Nature Reserve in western Kenya (Lepidoptera: Hesperioidea, Papilionoidea). *Nachrichten der entomologische Verein, Apollo*, 25:161-174.

LARSEN, T.B. 1994. The butterflies of Ghana - their implications for conservation and sustainable use. Report to IUCN and Dept. of Game & Wildlife, Ghana.

LARSEN, T.B. 1994b. Fruit-feeding butterflies in large numbers on flowers. *Entomologists' Record and Journal of Variation*, 106:157-158.

LARSEN, T.B. 1994c. *Anthene helpsi* sp. nov. - a remarkable new Lycaenid from Ghana (Lepidoptera, Lycaenidae). *Lambillionea*, 94:550-552.

LARSEN, T.B. [1994d]. A brief introduction to the butterflies of Kakum National Park. Kakum National Park.

LARSEN, T.B. 1994e. *Diopetes kakumi*, a new hairstreak from Kakum National Park, Ghana. *Tropical Lepidoptera*, 5:83-84. (WA 5)

LARSEN, T.B. 1995a. Butterfly biodiversity and conservation in the Afrotropical region. *in* PULLIN, A. S. (ed). *Ecology and Conservation of Butterflies*. Chapman & Hall, UK:290-303. (WA 1)

LARSEN, T.B. 1995b. Butterflies in Kakum National Park, Ghana. Part 1: Papilionidae, Pieridae & Lycaenidae. *Bulletin of the Amateur entomological Society*, 54:3-8, Part 2: Nymphalidae, Hesperiidae., *ibid*. 54:43-46.

LARSEN, T.B. 1995c. Butterflies in Kakum National Park, Ghana. *Metamorphosis*, 6:138-145.

LARSEN, T.B. 1996. *Graphium almansor* (Honrath 1884) in West Africa, and the status of G. carchedonius (Karsch 1895). *Lambillionea*, 96:137-140.

LARSEN, T.B. 1996b. Butterflies as indicator species in Africa - Presidential address: Association for Tropical Lepidoptera. *Tropical Lepidoptera News*, 3:1-4.

LARSEN, T.B. 1996. *Iolaus (Etesiolaus) kyabobo* - a new butterfly from Ghana (Lepidoptera; Lycaenidae). *Lambillionea*, 96:275-277.

LARSEN, T.B. 1997. An overview of the distribution patterns of Afrotropical rainforest butterflies (Lepidoptera: Rhopalocera). *The inaugural conference on African Lepidoptera. Nairobi - Kenya - 1-8 May 1997. Metamorphosis, 3, Occasional Supplement*:183-187.

LARSEN, T.B. 1997b. A revision of the Hypolycaena lebona group of African Lycaenidae (Lepidoptera), with description of two new species and one new subspecies. *Metamorphosis* 6:172-182.

LARSEN, T.B. 1997c. Butterflies in Kakum National Park. *In* GHANA WILDLIFE DEPARTMENT, *et al*. *Facing the Storm - five years of research in and around Kakum National Park, Ghana*. Conservation International, Washington DC, USA

LARSEN, T.B. 1997d. Korup butterflies - Biodiversity writ large. Report on a butterfly study mission to Korup National Park in Cameroun during January and February of 1997. Report to WWF and Korup National Park, 1-69.

LARSEN, T.B. 1999. *Butterflies of West Africa - origins, natural history, diversity, and conservation. Draft systematic part*. LARSEN CD-ROM, Manila.

LARSEN, T.B. 2001. The butterflies of Ankasa/Nini-Suhien and Bia protected area systems in western Ghana. Protected Areas Development Programme. UGL/Ghana Wildlife Department.

LARSEN, T.B. 2005. *Butterflies of West Africa*. 2 vols, 596pp, 125 plates. Apollo Books, Stenstrup, DK.

LARSEN, T.B. 2005b. Butterflies *in* McCULLLOUGH, J., DECHER, J. & GUBA-KPELLE, D. (eds.). 2005. *A biological assessment of the terrestrial ecosystems of the Draw River, Boi-Tano, Tano Nimiri and Krokosua Hills forest reserves, southwestern Ghana. RAP Bulletin of Biological Assessment 36*. Conservation International, Washington, DC.

LARSEN, T.B. 2006. The butterflies of Kyabobo National Park, Ghana and those of the Volta Region (Ghana and Togo). Wildlife Division & IUCN, Accra.

LARSEN, T.B. & COLLINS, S.C. 1998. Two new species of *Anthene* from West Africa (Lepidoptera, Lycaenidae). *Lambillionea*, 98:372-376.

LARSEN, T.B., RILEY, J. & CORNES, M. A. 1980. The butterfly fauna of a secondary bush locality in Nigeria. *Journal of Research in Lepidoptera,* 18:4-23.

LAWTON, J.H., BIGNELL, D.E., BOLTON, B., BLOEMERS, G.F., EGGLETON, P., HODDA, M., HOLT, R.D., LARSEN, T.B., MAWDSLEY, N.A., STORK, N.E., SRIVASTAVA, D.S., WATT, A.D. 1998. Biodiversity inventories, indicator taxa and effects of habitat modification in tropical forest. *Nature*, 391:72-76.

LIBERT, M. 1994. Biodiversité: le peuplement en Rhopalocères de deux collines de la Région de Yaoundé, Cameroun (Lepidoptera). *Revue de la Societé entomologique de France*, 99:335-355.

LIBERT, M. 2000. Révision du genre Epitolina Aurivillius, avec description de deux nouvelles espèces (Lepidoptera, Lycaenidae). *Lambillionea*, 100:95-115.

LIBERT, M. 2004. *Révision des Deudorix africains (Lepidoptera, Lycaenidae)*. Lambillionea, Tervuren, Belgium.

MARTIN, C. 1982. Management plan for the Bia wildlife conservation areas. General part 1. Mimeographed report on IUCN/WWF project 1251.

PIERRE, J, JOLY, C. & BERNAUD, D. 2003. Les *Acraea* du Ghana (Lepidoptera; Nymphalidae). *Lambillionea*, 103:297ff.

SAM, M.K. & WILSON, V.J. 1994. Zoological survey of Kogyae Strict Nature Reserve. GWD/IUCN Project 9786, Accra.

SETH-SMITH, D.W. 1938. Life histories of some butterflies in the northern territories of the Gold Coast. *Proceedings of the Royal entomological Society, London*, (A) 13:141-154.

SMITH, M.R. 1965. *A list of the Lepidoptera associated with cocoa in West Africa with notes on identification and biology of species in Ghana*. Cocoa Research Institute (Ghana Academy of Sciences). Tafo.

USHER, M. 1979. The *Neptis* butterflies (Nymphalidae) of Ghana. *Systematic Entomology*, 4:197-207.

USHER, M.B. 1980a. The *Andronymus caesar* complex of species (Hesperiidae). *Systematic Entomology*, 5:291-302.

USHER, M.B. 1980b. Three West African taxa of *Meza* Hemming (Lepidoptera: Hesperiidae). *Entomologica Scandinavica*, 11:424-427.

USHER, M.B. 1984. The *Abantis* species (Lepidoptera: Hesperiidae) of West Africa. *Systematic Entomology*, 9:351-356.

USHER, M.B. 1985. The species of *Henotesia* Butler (Lepidoptera: Nymphalidae, Satyrinae) in western West Africa. *Entomologica Scandinavica*, 16:259-264.

USHER, M.B. 1986. A new species of *Acraea* Fabricius (Lepidoptera: Nymphalidae: Acraeinae). *Systematic Entomology*, 11:111-115.

VANCLAY, J.K. 2004. Indicator groups and faunal richness. *FBMIS:*1:105-113.

WATSON, B.W.L. & DUODO, Y.A. 1984. Life history and seasonal occurrence of the Tossa Jute defoliator *A[craea]. terpsicore* (L.) (Lep., Nymphalidae) in Ghana. *Entomologists Monthly Magazine*, 120:47-53.

ITINERARY

08.viii Travel London-Accra with KLM
09.viii Preparations, literature, and shopping Accra
14.viii Arrival of Hein Boersma
15.viii Kalakpa Zitoe Riverine forest poor weather
16.viii Kalakpa Zitoe Riverine forest better weather
17.viii Kalakpa - effectively washout
18.viii Kalapka Agodake poor weather
19.viii Wli Falls - full day, fair weather
20.viii Travel to Nkwanta - day washout
21.viii Travel to Koue-Nazeni, weather indifferent,
22.viii Travel to Pawa, walk to Pawa Camp
23.viii Sleep at Pawa Camp
24.viii Travel to Nkwanta
25.viii Collect at Odome Camp and Laboum area
26.viii Travel to Wli Falls, weather indifferent
27.viii Travel to Shai Hills, weather good
28.viii Collecting in Shai Hills, travel to Accra
29.viii Shopping and practical issues in Accra
30.viii Travel to Atewa – raining. Sleep Bunso
31.viii Collecting in Bunso.
1.ix Travel to Bobiri
2.ix Collect Bobiri
3.ix Travel to Bomfobiri
4.ix Walk to Kumawu/Bomfobiri Waterfall
5.ix Washout
6.ix Collecting from points on Bomfobiri Wildlife/Forestry Boundary
7.ix Travel to Bobiri, drop H. Boersma
8.ix Travel to Atebubu
9.ix Travel to Dome Camp
10.ix Collect out of Dome Base Camp
11.ix Travel to Daditokro - collecting to fisher village and back
13.ix Travel to Atebubu - debriefing - discussing butterfly project N/S
14.ix Return to Bobiri - final collecting and debriefing H. Boersma
15.ix Work of field notes in Ejisu (Washington Hotel) - H. Boersma to Accra/KLM
17.ix Depart for Kumasi and Tamale
18.ix Collect on Gambaga Scarp, sleep Gambaga
19.ix Collect in Gambaga East Forest Reserve, sleep Gambaga
20.ix Collect at Nakpanduri and sampling between there and Bawku. Sleep Zongoiri
21.ix Collect at Hunters' Camp and Bongo. Proceed to Bolgatanga
22.ix Travel to Tumu. Visit G. Punguse in Navrongo. Briefing on Gbele Resource Reserve
23.ix Travel to Wahabu Base Camp, Gbele
26.ix Travel to Gbele Base Camp, Gbele
27.ix Collect at Gbele Base Camp, 26-27 September
27.ix Travel to Wa - searching for Sudan Savannah (no luck)
28.ix Travel to Bui National Park
29.ix Collecting on Black Volta River and Battor Village
30.ix Collecting in forest at Battor Camp and in savannah
1.x Collecting in savannah, travel to Kumasi after washout.

2.x Report-writing in Kumasi
3.x Travel to Tano Ofin Forest Reserve. Collect in Domeabra area
4.x Collect in Tano Ofin, Mantukwa area. Return to Kumasi
5.x Collect in Owabi Nature Sanctuary
6.x Work in Kumasi. Visit KNUST (Institute of Renewable Natural Resources)
7.x Return to Accra
8.x Accra work and car repairs
9.x Accra work
10.x Accra work
11.x Travel to Cape Coast
12.x Travel to Cape Three Points. Collect at Tumentu
13.x Sleep Tumentu
14.x Sleep Tumentu
15.x Sleep Tumentu
16.x Return to Accra
25.x Return to London by KLM

LOCALITY	hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH

APPENDIX 1A THE BUTTERFLIES OF THE PROTECTED AREAS SYSTEM IN GHANA (other selected localities are listed in appendix 1b) Torben B. Larsen, February 2006

Numbers: The numbering refers to the book *Butterflies of West Africa – origins, natural history, diversity, conservation* – Missing number belong to West African species not found in Ghana.

Legends:
The following three-letter codes are used for the 15 protected areas in Ghana:
KAK = Kakum National Park
ANK = Ankasa/Nini Suhien
BIA = Bia National Park
OWA = Owabi Nature Sanctuary
BOA = Boabeng-Fiema Monkey Sanctuary
WLI = Wli Falls Nature Sanctuary
KYA = Kyabobo National Park
BOM = Bomfobiri Nature Sanctuary
BUI = Bui National Park
MOL = Mole National Park
GBE = Gbele Resource Reserve
DIG = Digya National Park
KOG = Kogyae Strict Nature Reserve
KAL = Kalakpa National Park
SHH = Shai Hills Resource Reserve
CAPITAL letters imply that the species has been authoritatively recorded from the locality e.g. KAK
lower case letters imply that the species is almost certain to occur in the locality e.g. kak
ooo implies that the species might occur in the locality
-- implies that the species does not occur in the locality

LOCALITY	hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH

All species are roughly allocated to a main habitat type. Many butterflies are quite flexible in their requirements and the classification is still a rough guide (**hab**)

WEF implies that the species is centered on Wet Evergreen Forest
MEF implies that the species is centered on Moist Forests
DRF implies that the species is centered on Drier Semi-deciduous and marginal forests
ALF implies that the species is found in any type of forest
GUI implies that the species is centered on the Guinea Savannah
SUD implies that the species is centered on the Sudan Savannah
SPE implies that the species is found in special habitats
UBQ species that are practically ubiquitous through all habitats in most of Africa

The species are roughly graded by rarity, though this is always a difficult call to make. Very rare species may one day be numerous in a single locality. Very common butterflies are sometimes absent. However, the following notations are used (**ra**):

VC = very common – species that are usually found on any visit to a suitable locality
CO = common – species that are usually found on 75% of visits to most suitable localities
NR = not rare – met with frequently but often not common
RA = rare – species that are usually found on 75% of visits to most suitable localities
VR = very rare – species that are usually found on less than 5% of visits to most suitable localities

species that have been recorded within the protected areas system (**np**)
~ species that have not been recorded within the protected areas system

NOTE Subspecies, where applicable, are given in appendix 1b.
Authors and dates of description are found in Larsen (2005).
Endemic species are annotated in table 1b,

LOCALITY		hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
PAPILIONIDAE																			
PAPILIO																			
1	antimachus	WEF	VR	~	—	ooo	ooo	—	—	ooo	—	—	—	—	—	—	—	—	—
2	zalmoxis	WEF	VR	#	ooo	ank	BIA	—	—	—	—	—	—	—	—	—	—	—	—
4	dardanus	ALF	NR	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	—	—	ooo	KOG	KAL	SHH
5	phorcas	ALF	RA	#	KAK	ank	bia	ooo	—	WLI	ooo	—	—	—	—	—	—	—	—
7	horribilis	WEF	NR	#	KAK	ANK	BIA	—	—	—	—	—	—	—	—	—	—	—	—
9	chrapkowskoides	MEF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	kya	—	—	—	—	—	—	—	—
10	sosia	ALF	NR	#	KAK	ANK	BIA	owa	boa	WLI	kya	—	ooo	—	—	ooo	ooo	—	—
11	nireus	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	BOM	BUI	mol	gbe	dig	KOG	KAL	SHH
12	menestheus	WEF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	ooo	—	—	ooo	ooo	KAL	—
13	demodocus	UBQ	VC	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
15	cyproeofila	MEF	CO	#	KAK	ANK	BIA	owa	ooo	???	???	—	—	—	—	—	—	—	—
16	zenobia	MEF	NR	#	KAK	ANK	BIA	owa	ooo	—	—	—	—	—	—	—	—	—	—
17	nobicea	MEF	NR	#	—	—	—	—	—	WLI	KYA	—	—	—	—	—	—	—	—
18	cynorta	MEF	NR	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	ooo	—	—	ooo	ooo	kal	—
GRAPHIUM																			
20	angolanus	GUI	CO	#	KAK	ooo	bia	owa	BOA	WLI	KYA	BOM	bui	MOL	GBE	DIG	KOG	KAL	SHH
22	tynderaeus	WEF	RA	#	KAK	ANK	BIA	—	—	—	—	—	—	—	—	—	—	—	—
23	latreillianus	WEF	NR	#	KAK	ANK	ooo	—	—	—	—	—	—	—	—	—	—	—	—
24	almansor	DRF	NR	#	—	—	—	—	—	WLI	KYA	—	—	—	—	—	—	—	—
25	adamastor	DRF	NR	#	—	—	ooo	ooo	BOA	wli	KYA	BOM	ooo	mol	ooo	dig	KOG	kal	shh
26	agamedes	DRF	RA	~	—	—	—	—	ooo	ooo	kya	ooo	—	ooo	—	ooo	—	ooo	—
28	rileyi	WEF	RA	~	ooo	ank	ooo	—	—	—	—	—	—	—	—	—	—	—	—
29	leonidas	UBQ	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	BOM	BUI	mol	gbe	dig	KOG	kal	SHH
30	illyris	WEF	NR	#	KAK	ank	BIA	—	—	—	—	—	—	—	—	—	—	—	—
31	policenes	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	ooo	—	—	dig	ooo	kal	SHH
32	liponesco	WEF	NR	#	KAK	ANK	BIA	—	ooo	wli	kya	—	—	—	—	—	—	KAL	—
34	antheus	ALF	NR	#	KAK	ank	BIA	owa	BOA	WLI	KYA	—	bui	—	—	dig	ooo	ooo	—
PIERIDAE																			
PSEUDOPONTIINAE																			
PSEUDOPONTIA																			
35	paradoxa	WEF	NR	#	kak	ANK	ooo	—	—	—	—	—	—	—	—	—	—	—	—

LOCALITY		hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
COLIADINAE																			
CATOPSILIA																			
36	florella	UBQ	VC	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
EUREMA																			
38	senegalensis	MEF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	—	—	—	—	—	—	—
39	hecabe	UBQ	VC	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
40	floricola	UBQ	NR	#	KAK	ANK	BIA	owa	boa	WLI	KYA	ooo	BUI	mol	—	DIG	kog	KAL	—
41	hapale	SPE	VR	~	kak	ank	bia	ooo	ooo	—	—	—	ooo	—	—	ooo	ooo	ooo	—
42	desjardinsii	UBQ	NR	#	KAK	ank	bia	owa	BOA	WLI	KYA	bom	bui	mol	GBE	DIG	kog	KAL	SHH
43	brigitta	GUI	NR	#	KAK	ANK	BIA	owa	BOA	wli	KYA	bom	BUI	MOL	GBE	DIG	KOG	KAL	SHH
PIERINAE																			
PINACOPTERYX																			
44	eriphia	SUD	NR	~	—	—	—	—	—	—	—	—	—	—	gbe	—	—	—	—
NEPHERONIA																			
45	argia	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	—	—	ooo	ooo	KAL	ooo
46	thalassina	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	kya	BOM	BUI	—	—	DIG	kog	KAL	shh
47	pharis	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	ooo	BUI	—	—	—	ooo	KAL	—
COLOTIS																			
54	vesta	SUD	NR	~	—	—	—	—	—	—	—	—	—	mol	gbe	—	—	—	—
57	celimene	SUD	RA	~	—	—	—	—	—	—	—	—	—	ooo	ooo	—	—	—	—
58	ione	SUD	NR	~	—	—	—	—	—	—	—	—	—	ooo	gbe	—	—	—	—
60	danae	SUD	NR	~	—	—	—	—	—	—	—	—	—	mol	gbe	—	—	—	—
61	aurora	SUD	NR	#	—	—	bia	ooo	ooo	ooo	ooo	—	—	mol	GBE	—	ooo	—	ooo
62	antevippe	SUD	NR	#	—	—	bia	owa	ooo	wli	ooo	—	ooo	mol	gbe	ooo	KOG	ooo	SHH
63	euippe	UBQ	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	dig	KOG	KAL	SHH
65	evagore	SUD	CO	#	—	—	—	owa	boa	ooo	kya	bom	BUI	MOL	gbe	ooo	ooo	ooo	SHH
BELENOIS																			
68	aurota	SUD	CO	#	kak	ank	BIA	owa	BOA	WLI	kya	bom	bui	mol	gbe	dig	kog	kal	shh
69	creona	SUD	VC	#	KAK	ank	bia	owa	boa	WLI	kya	bom	BUI	mol	GBE	dig	kog	kal	SHH
70	gidica	SUD	NR	#	—	—	—	—	—	—	—	—	—	mol	gbe	ooo	—	—	SHH
72	subeida	SUD	NR	#	—	—	—	—	—	—	—	—	—	MOL	gbe	—	—	—	—
73	calypso	ALF	VC	#	KAK	ANK	BIA	OWA	BOA	WLI	kya	BOM	BUI	mol	ooo	DIG	KOG	KAL	SHH
74	theora	MEF	CO	#	KAK	ANK	BIA	owa	ooo	WLI	ooo	—	ooo	—	—	—	—	ooo	—

LOCALITY		hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
76	hedyle	DRF	NR	#	KAK	ooo	bia	owa	ooo	WLI	KYA	—	—	—	—	—	—	ooo	—
DIXEIA																			
78	doxo	SUD	NR	~	—	—	—	—	—	—	—	—	—	ooo	gbe	—	—	—	—
79	orbona	SUD	NR	~	—	—	—	—	—	—	—	—	—	mol	gbe	—	—	—	—
80	cebron	DRF	NR	#	kak	ooo	BIA	owa	boa	wli	kya	—	ooo	—	—	—	ooo	kal	—
81	capricornus	DRF	NR	#	kak	ooo	bia	owa	ooo	ooo	ooo	—	—	—	—	—	—	—	—
APPIAS																			
84	sylvia	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	BOM	BUI	—	—	—	kog	KAL	SHH
85	phaola	WEF	NR	#	KAK	ANK	bia	—	—	—	—	—	—	—	—	—	—	—	—
86	sabina	MEF	CO	#	KAK	ANK	BIA	ooo	boa	WLI	KYA	—	—	—	—	—	—	—	—
87	epaphia	UBQ	CO	#	KAK	ANK	bia	owa	boa	WLI	KYA	bom	BUI	—	—	dig	KOG	kal	SHH
LEPTOSIA																			
88	alcesta	ALF	vc	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	ooo	BUI	ooo	—	DIG	kog	KAL	SHH
90	hybrida	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	wli	KYA	—	ooo	—	—	ooo	—	ooo	—
91	medusa	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	ooo	ooo	BOM	ooo	—	—	dig	—	kal	—
92	marginea	MEF	NR	#	KAK	ANK	BIA	ooo	ooo	WLI	KYA	—	—	—	—	—	—	ooo	—
93	wigginsi	ALF	NR	#	kak	ANK	BIA	ooo	ooo	WLI	KYA	—	ooo	ooo	—	ooo	—	KAL	SHH
MYLOTHRIS																			
95	chloris	UBQ	VC	#	KAK	ank	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	kog	KAL	SHH
100	dimidiata	WEF	NR	#	KAK	ANK	ooo	—	—	—	—	—	—	—	—	—	—	—	—
103	aburi	DRF	NR	#	—	—	ooo	—	ooo	wli	KYA	—	ooo	mol	—	ooo	ooo	—	—
106	poppea	MEF	NR	#	KAK	ANK	BIA	—	BOA	WLI	KYA	—	—	—	—	ooo	ooo	ooo	SHH
107	spica	MEF	NR	#	KAK	ank	BIA	OWA	—	—	—	—	—	—	—	—	—	—	—
109	rhodope	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	ooo	—	—	ooo	ooo	kal	SHH
110	jaopura	ALF	CO	#	KAK	ANK	BIA	—	ooo	WLI	KYA	—	—	—	—	—	—	—	—
111	schumanni	MEF	NR	#	KAK	ANK	BIA	OWA	ooo	WLI	KYA	—	BUI	—	—	—	—	—	—
112	atewa	WEF	NR	~	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
LYCAENIDAE																			
MILETINAE																			
EULIPHYRA																			
114	hewitsoni	MEF	RA	#	kak	ANK	BIA	ooo	—	wli	—	—	—	—	—	—	—	—	—
115	mirifica	MEF	RA	#	KAK	—	—	ooo	—	—	—	—	—	—	—	—	—	—	—
116	leucyania	WEF	RA	~	kak	ank	bia	ooo	—	wli	—	—	—	—	—	—	—	—	—

LOCALITY	hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
ASLAUGA																		
117 *ernesti*	DRF	VR	~	—	—	—	—	—	wli	kya	—	—	—	—	—	—	—	—
118 *marginalis*	MEF	NR	#	KAK	ank	BIA	owa	ooo	wli	KYA	—	—	—	—	—	—	—	—
121 *lamborni*	WEF	RA	#	kak	ank	BIA	—	—	—	—	—	—	—	—	—	—	—	—
124 *imitans*	MEF	RA	#	—	—	—	—	—	wli	KYA	—	—	—	—	—	—	—	—
MEGALOPALPUS																		
127 *zymna*	ALF	CO	#	KAK	ANK	BIA	owa	—	wli	KYA	—	—	—	—	—	—	—	—
129 *metaleucus*	MEF	NR	#	KAK	ANK	BIA	ooo	—	wli	KYA	—	—	—	—	—	—	—	—
SPALGIS																		
130 *lemolea*	DRF	NR	#	KAK	ank	BIA	owa	BOA	WLI	KYA	bom	bui	mol	ooo	dig	kog	kal	ooo
LACHNOCNEMA																		
131 *vuattouxi*	DRF	NR	#	KAK	ank	BIA	owa	boa	wli	kya	bom	bui	mol	ooo	dig	KOG	kal	ooo
133 *emperanus*	DRF	NR	#	kak	ANK	bia	owa	boa	wli	KYA	—	—	—	GBE	—	—	KAL	—
135 *disrupta*	MEF	RA	~	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
136 *reutlingeri*	MEF	RA	~	ooo	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
137 *luna*	WEF	RA	~	—	—	—	—	—	wli	—	—	—	—	—	—	—	—	—
139 *albimacula*	WEF	RA	~	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
LIPTENINAE																		
PTELINA																		
141 *carnuta*	MEF	NR	#	KAK	ANK	BIA	owa	ooo	WLI	KYA	—	—	—	—	—	—	—	—
PENTILA																		
142 *pauli*	DRF	NR	#	KAK	ooo	bia	owa	BOA	WLI	KYA	—	ooo	—	—	—	—	KAL	—
144 *petreoides*	WEF	VR	~	—	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
147 *petreia*	MEF	CO	#	KAK	ANK	BIA	owa	—	wli	KYA	—	—	—	—	—	—	—	—
152 *picena*	MEF	NR	#	KAK	ANK	BIA	owa	ooo	WLI	KYA	—	—	—	—	—	—	KAL	—
155 *phidia*	MEF	NR	#	KAK	ooo	BIA	owa	boa	wli	KYA	—	—	—	—	—	—	—	—
157 *hewitsonii*	MEF	NR	#	kak	ank	BIA	ooo	—	ooo	—	—	—	—	—	—	—	—	—
TELIPNA																		
159 *acraea*	WEF	NR	#	KAK	ANK	bia	owa	ooo	—	—	—	—	—	—	—	—	—	—
160 *semirufa*	WEF	NR	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
161 *maesseni*	WEF	NR	#	—	—	—	—	—	WLI	KYA	—	—	—	—	—	—	—	—

LOCALITY		hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
ORNIPHOLIDOTOS																			
170	nigeriae	WEF	RA	#	kak	ank	BIA	owa	—	—	—	—	—	—	—	—	—	—	—
171	onitshae	WEF	RA	#	KAK	ank	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
172	irwini	WEF	RA	~	kak	ank	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
173	issia	WEF	RA	~	kak	ank	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
174	tiassale	WEF	NR	#	KAK	ANK	BIA	owa	—	—	—	—	—	—	—	—	—	—	—
175	nympha	WEF	RA	#	KAK	ank	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
TORBENIA																			
177	wojtusiaki	WEF	RA	#	KAK	ANK	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
MIMACRAEA																			
179	neurata	WEF	RA	#	KAK	ank	bia	ooo	—	WLI	KYA	—	—	—	—	—	—	—	—
181	darwinia	WEF	NR	#	KAK	ank	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
182	maesseni	WEF	NR	#	—	—	—	—	—	WLI	kya	—	—	—	—	—	—	—	—
MIMERESIA																			
184	libentina	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	bui	—	—	dig	kog	KAL	—
185	moyambina	WEF	VR	~	kak	ank	ooo	—	—	—	—	—	—	—	—	—	—	—	—
186	debora	WEF	VR	~	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
187	semirufa	WEF	RA	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
190	cellularis	WEF	RA	~	kak	ank	ooo	—	—	wli	—	—	—	—	—	—	—	—	—
191	issia	WEF	RA	#	KAK	ANK	ooo	—	—	—	—	—	—	—	—	—	—	—	—
PSEUDERESIA																			
192	eleaza	WEF	NR	#	KAK	ank	bia	OWA	—	wli	—	—	—	—	—	—	—	—	—
ERESIOMERA																			
193	bicolor	MEF	NR	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	—	—	—	—	—	—	—
194	isca	WEF	RA	#	KAK	ank	BIA	owa	—	—	—	—	—	—	—	—	—	—	—
195	jacksoni	WEF	VR	~	kak	ank	ooo	—	—	—	—	—	—	—	—	—	—	—	—
197	petersi	WEF	RA	#	KAK	ANK	BIA	—	—	—	—	—	—	—	—	—	—	—	—
CITRINOPHILA																			
199	marginalis	MEF	CO	#	KAK	ANK	BIA	OWA	boa	WLI	KYA	—	—	—	—	—	—	—	—
200	similis	MEF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	bui	—	—	dig	—	KAL	—
202	erastus	WEF	NR	#	kak	ank	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
ERESINA																			
204	maesseni	MEF	RA	~	kak	ank	bia	owa	—	—	—	—	ooo	—	—	ooo	—	ooo	
206	pseudofusca	MEF	RA	#	kak	ank	BIA	ooo	ooo	wli	kya	—	—	—	—	—	—	—	—

LOCALITY		hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
210	saundersi	MEF	RA	~	kak	ank	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
212	theodori	MEF	RA	#	kak	ank	BIA	ooo	boa	wli	kya	—	—	—	—	—	—	—	—
ARGYROCHEILA																			
213	undifera	WEF	RA	#	KAK	ank	BIA	—	—	—	—	—	—	—	—	—	—	—	—
LIPTENA																			
216	submacula	MEF	NR	#	KAK	ANK	BIA	owa	boa	WLI	ooo	—	—	—	—	—	—	—	—
217	griveaudi	WEF	VR	~	ooo	ank	ooo	—	—	—	—	—	—	—	—	—	—	—	—
218	simplicia	MEF	CO	#	KAK	ANK	BIA	owa	boa	wli	ooo	—	bui	—	—	dig	—	kal	—
222	tiassale	MEF	RA	~	ooo	ooo	bia	—	—	—	—	—	—	—	—	—	—	—	—
224	albicans	WEF	RA	~	kak	ank	bia	ooo	—	ooo	—	—	—	—	—	—	—	—	—
225	alluaudi	WEF	NR	#	KAK	ank	BIA	ooo	—	wli	KYA	—	—	—	—	—	—	—	—
226	fatima	???	VR	~	ooo	ooo	bia	—	—	—	—	—	—	—	—	—	—	—	—
227	pearmani	WEF	VR	#	—	—	—	—	—	wli	KYA	—	—	—	—	—	—	—	—
229	ferrymani	DRF	RA	~	—	—	ooo	—	—	ooo	ooo	—	—	ooo	—	dig	—	kal	—
231	septistrigata	DRF	NR	~	—	—	bia	ooo	boa	ooo	ooo	—	ooo	—	—	—	—	ooo	—
232	evanescens	WEF	RA	~	kak	ank	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
234	xanthostola	WEF	RA	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
236	rochei	DRF	RA	#	kak	ooo	BIA	ooo	—	WLI	—	—	—	—	—	—	—	—	—
237	flavicans	MEF	RA	#	kak	ank	bia	ooo	—	WLI	—	—	—	—	—	—	—	—	—
239	seyboui	WEF	VR	~	ooo	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
240	similis	WEF	RA	#	kak	ank	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
242	helena	WEF	NR	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
243	catalina	WEF	NR	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
KAKUMIA																			
246	otlauga	WEF	NR	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
FALCUNA																			
249	leonensis	MEF	CO	#	KAK	ANK	BIA	owa	—	—	—	—	—	—	—	—	—	—	—
252	campimus	WEF	NR	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
TETRARHANIS																			
254	symplocus	MEF	CO	#	KAK	ANK	BIA	OWA	boa	WLI	KYA	—	—	—	—	—	—	—	—
255	baralingam	WEF	RA	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
260	stempfferi	WEF	VR	~	ooo	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—
LARINOPODA																			
264	aspidos	MEF	NR	#	—	—	—	—	—	WLI	KYA	—	—	—	—	—	—	KAL	—

LOCALITY	hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
265 *eurema*	MEF	CO	#	KAK	ANK	BIA	OWA	—	—	—	—	—	—	—	—	—	—	—
MICROPENTILA																		
266 adelgitha	MEF	CO	#	KAK	ANK	BIA	owa	—	ooo	—	—	—	—	—	—	—	—	—
267 adelgunda	MEF	VR	#	kak	ank	BIA	ooo	—	ooo	—	—	—	—	—	—	—	—	—
268 dorothea	MEF	NR	~	kak	ank	bia	ooo	—	ooo	—	—	—	—	—	—	—	—	—
270 brunnea	WEF	RA	#	KAK	ANK	bia	owa	—	—	—	—	—	—	—	—	—	—	—
275 mamfe	WEF	VR	~	ooo	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
IRIDANA																		
278 incredibilis	ALF	RA	~	kak	ank	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
279 ghanana	ALF	VR	~	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
280 *exquisuta*	MEF	RA	#	kak	ANK	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
281 nigeriana	ALF	RA	~	ooo	ank	bia	ooo	—	wli	ooo	—	—	—	—	—	—	—	—
282 hypocala	MEF	VR	~	—	—	—	—	—	ooo	ooo	—	—	—	—	—	—	—	—
HEWITSONIA																		
283 boisduvalii	WEF	NR	#	KAK	ANK	BIA	owa	ooo	—	—	—	—	—	—	—	—	—	—
284 occidentalis	MEF	RA	#	kak	ANK	bia	owa	ooo	—	—	—	—	—	—	—	—	—	—
286 inexpectata	MEF	NR	#	kak	ANK	BIA	ooo	ooo	WLI	ooo	—	—	—	—	—	—	—	—
CERAUTOLA																		
289 crowleyi	MEF	NR	#	kak	ank	bia	ooo	ooo	wli	KYA	—	—	—	—	—	—	—	—
291 ceraunia	MEF	NR	#	KAK	ank	bia	ooo	ooo	wli	ooo	—	—	—	—	—	—	—	—
EPITOLA																		
294 posthumus	MEF	NR	#	kak	ank	BIA	owa	ooo	WLI	KYA	—	—	—	—	—	—	—	—
295 uranoides	MEF	RA	#	KAK	ank	bia	owa	ooo	wli	ooo	—	—	—	—	—	—	—	—
296 urania	MEF	RA	#	kak	ank	bia	ooo	ooo	wli	KYA	—	—	—	—	—	—	—	—
CEPHETOLA																		
297 cephena	MEF	NR	#	kak	ank	bia	owa	boa	WLI	kya	—	—	—	—	—	—	—	—
299 pinodes	MEF	RA	~	kak	ank	bia	ooo	ooo	ooo	ooo	—	—	—	—	—	—	—	—
300 subcoerulea	MEF	RA	~	ooo	ooo	bia	ooo	ooo	ooo	ooo	—	—	—	—	—	—	—	—
302 mercedes	MEF	RA	~	ooo	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
303 obscura	MEF	RA	#	KAK	ank	bia	ooo	ooo	ooo	ooo	—	—	—	—	—	—	—	—
305 sublustris	MEF	NR	~	ooo	ooo	bia	owa	ooo	ooo	ooo	—	—	—	—	—	—	—	—
306 maesseni	MEF	RA	~	—	—	—	—	—	wli	ooo	—	—	—	—	—	—	—	—
307 collinsi	MEF	VR	~	ooo	ank	bia	ooo	—	—	—	—	—	—	—	—	—	—	—

LOCALITY		hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
HYPOPHYTALA																			
308	*hyettoides*	MEF	NR	#	KAK	ank	bia	owa	ooo	wli	kya	—	—	—	—	—	—	—	—
310	*hyettina*	MEF	RA	#	kak	ank	bia	—	—	wli	KYA	—	—	—	—	—	—	—	—
311	*henleyi*	MEF	RA	~	kak	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
312	*benitensis*	WEF	RA	#	kak	BIA	bia	—	—	ooo	ooo	—	—	—	—	—	—	—	—
PHYTALA																			
314	*elais*	WEF	RA	#	KAK	ank	bia	ooo	—	ooo	ooo	—	—	—	—	—	—	—	—
GERITOLA																			
315	*gerina*	WEF	RA	#	KAK	ank	bia	—	—	ooo	ooo	—	—	—	—	—	—	—	—
320	*virginea*	WEF	RA	~	kak	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
STEMPFFERIA																			
322	*cercene*	WEF	RA	#	KAK	ank	bia	—	—	ooo	ooo	—	—	—	—	—	—	—	—
324	*moyambina*	WEF	NR	#	KAK	ank	bia	owa	—	—	—	—	—	—	—	—	—	—	—
326	*dorothea*	WEF	NR	#	kak	ank	BIA	owa	—	WLI	ooo	—	—	—	—	—	—	—	—
330	*leonina*	MEF	NR	#	KAK	ank	bia	OWA	boa	ooo	ooo	—	—	—	—	—	—	—	—
334	*ciconia*	WEF	NR	#	kak	ank	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
335	*zelza*	WEF	NR	~	—	—	—	—	—	wli	ooo	—	—	—	—	—	—	—	—
340	*michelae*	ALF	NR	#	KAK	ank	BIA	owa	—	—	—	—	—	—	—	—	—	—	—
342	*kholifa*	WEF	NR	#	kak	ank	bia	OWA	—	—	—	—	—	—	—	—	—	—	—
344	*staudingeri*	WEF	RA	~	kak	ank	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
AETHIOPANA																			
346	*honorius*	WEF	NR	#	KAK	ANK	BIA	owa	ooo	wli	KYA	—	—	—	—	—	—	—	—
EPITOLINA																			
347	*dispar*	MEF	CO	#	KAK	ANK	BIA	OWA	ooo	WLI	KYA	—	—	—	—	—	—	—	—
348	*melissa*	MEF	CO	#	KAK	ANK	BIA	owa	ooo	—	—	—	—	—	—	—	—	—	—
350	*catori*	WEF	NR	#	kak	ank	BIA	ooo	—	WLI	ooo	—	—	—	—	—	—	—	—
NEAVEIA																			
352	*lamborni*	MEF	RA	~	kak	ank	bia	ooo	ooo	wli	—	—	—	—	—	—	—	—	—
THECLINAE																			
MYRINA																			
354	*silenus*	GUI	NR	#	KAK	ANK	bia	ooo	boa	wli	KYA	bom	bui	mol	gbe	dig	kog	kal	SHH
355	*subornata*	GUI	RA	~	—	—	ooo	—	ooo	—	kya	—	—	mol	gbe	—	—	—	shh

LOCALITY	hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
OXYLIDES																		
356 faunus	MEF	CO	#	KAK	ANK	BIA	OWA	ooo	WLI	KYI	—	—	—	—	ooo	—	KAL	—
DAPIDODIGMA																		
359 hymen	MEF	NR	#	KAK	ANK	BIA	owa	ooo	WLI	KYA	—	—	—	—	dig	kog	kal	shh
360 demeter	MEF	RA	#	kak	ANK	BIA	ooo	ooo	WLI	kya	—	—	—	—	—	—	—	—
APHNAEUS																		
361 orcas	MEF	NR	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	bui	—	—	dig	—	ooo	—
362 argyrocyclus	MEF	RA	#	KAK	ank	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
363 asterius	MEF	RA	#	KAK	ank	ank	—	—	—	—	—	—	—	—	—	—	—	—
364 brahami	GUI	RA	~	—	—	ooo	—	—	wli	kya	bom	bui	mol	gbe	dig	kog	kal	shh
365 jefferyi	MEF	VR	~	kak	ank	ank	—	—	—	—	—	—	—	—	—	—	—	—
366 charboneli	WEF	VR	~	kak	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
367 gilloni	MEF	VR	~	ooo	ooo	ooo	—	—	wli	—	—	—	—	—	—	—	—	—
APHARITIS																		
368 nilus	SUD	RA	~	—	—	—	—	—	—	—	—	—	mol	gbe	—	—	—	shh
SPINDASIS																		
369 mozambica	GUI	NR	#	KAK	ank	bia	owa	BOA	wli	KYA	bom	bui	mol	gbe	dig	kog	kal	SHH
370 avriko	GUI	RA	#	—	—	—	—	—	ooo	KYA	ooo	—	ooo	ooo	ooo	—	ooo	ooo
371 crustaria	MEF	RA	~	—	—	—	—	—	ooo	—	—	—	—	—	—	—	—	—
372 iza	MEF	RA	~	kak	ank	bia	—	—	ooo	—	—	—	—	—	—	—	—	—
373 menelas	DRF	VR	~	ooo	ank	bia	—	—	wli	ooo	—	—	—	—	—	—	—	—
ZERITIS																		
374 neriene	SUD	NR	~	ooo	ooo	bia	ooo	ooo	ooo	KYA	ooo	ooo	mol	ooo	ooo	ooo	ooo	ooo
AXIOCERSES																		
375 harpax	GUI	NR	#	KAK	ANK	BIA	owa	boa	wli	KYA	bom	bui	mol	GBG	dig	kog	KAL	SHH
377 amanga	SUD	RA	#	—	—	ooo	—	ooo	—	—	—	ooo	mol	GBE	—	—	—	ooo
LIPAPHNAEUS																		
378 leonina	MEF	NR	#	KAK	ank	bia	ooo	ooo	wli	—	—	—	—	—	—	—	—	—
379 aderna	GUI	NR	#	ooo	ooo	bia	ooo	ooo	WLI	ooo	—	ooo	—	—	—	—	—	—
PSEUDALETIS																		
380 agrippina	MEF	VR	~	ooo	ank	bia	ooo	—	wli	—	—	—	—	—	—	—	—	—
386 subangulata	MEF	VR	~	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
390 dardanella	MEF	VR	~	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
391 leonis	MEF	RA	#	KAK	ank	bia	owa	—	wli	ooo	—	—	—	—	—	—	—	—

LOCALITY		hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
IOLAUS																			
Subgenus Iolaus																			
392	*eurisus*	ALF	NR	#	KAK	ANK	BIA	owa	boa	WLI	KYA	ooo	bui	—	—	ooo	ooo	kal	—
Subgenus Iolaphilus																			
393	menas	SUD	NR	~	—	—	—	—	—	ooo	kya	ooo	—	mol	gbe	ooo	ooo	ooo	ooo
395	carolinae	MEF	VR	~	ooo	ooo	bia	—	—	—	—	—	—	—	—	—	—	—	—
397	iulus	MEF	NR	#	KAK	ank	bia	OWA	BOA	WLI	kya	—	—	—	—	—	—	—	—
Subgenus Philiolaus																			
398	ismenias	SUD	NR	#	—	—	ooo	—	boa	wli	KYA	bom	bui	mol	GBE	dig	kog	kal	shh
400	alcibiades	MEF	RA	~	kak	ank	bia	owa	—	wli	—	—	—	—	—	—	—	—	—
401	parasilanus	MEF	RA	#	—	—	—	—	—	WLI	—	—	—	—	—	—	—	—	—
402	paneperata	MEF	NR	#	kak	ank	bia	ooo	—	WLI	—	—	—	—	—	—	—	—	—
403	lukabas	MEF	RA	~	ooo	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—
404	mane	MEF	RA	~	ooo	ank	bia	ooo	—	wli	ooo	—	—	—	—	—	—	—	—
405	theodori	MEF	VR	~	—	—	—	—	—	wli	—	—	—	—	—	—	—	—	—
406	likpe	MEF	VR	~	—	—	—	—	—	wli	—	—	—	—	—	—	—	—	—
407	calisto	MEF	NR	#	KAK	ank	BIA	owa	boa	wli	KYA	—	—	—	—	—	—	—	—
408	laonides	WEF	RA	~	kak	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
Subgenus Tanuetheira																			
410	timon	MEF	RA	~	kak	ank	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
Subgenus Epamera																			
411	alienus	SUD	RA	~	—	—	—	—	—	—	—	—	—	mol	gbe	—	—	—	—
414	scintillans	SUD	NR	~	—	—	—	—	ooo	ooo	kya	bom	bui	mol	gbe	ooo	—	—	ooo
415	laon	MEF	NR	#	kak	ank	bia	ooo	ooo	WLI	KYA	—	—	—	—	—	—	—	—
418	banco	WEF	RA	~	ooo	ank	ooo	—	—	—	—	—	—	—	—	—	—	—	—
426	sappirus	WEF	RA	#	kak	ANK	BIA	ooo	ooo	wli	ooo	—	—	—	—	—	—	—	—
428	bellina	MEF	NR	~	kak	ank	bia	owa	ooo	wli	KYA	—	—	—	—	—	—	—	—
432	fontainei	WEF	RA	~	—	—	—	—	—	wli	ooo	—	—	—	—	—	—	—	—
434	aethria	MEF	RA	#	kak	ank	bia	ooo	ooo	WLI	KYA	—	—	—	—	—	—	—	—
435	farquharsoni	MEF	RA	~	kak	ank	bia	ooo	ooo	wli	ooo	—	—	—	—	—	—	—	—
436	iasis	ALF	NR	#	KAK	bia	BIA	owa	BOA	WLI	KYA	—	bui	—	—	dig	kog	kal	SHH
437	maesa	MEF	RA	#	ooo	ooo	ooo	—	—	wli	KYA	—	—	—	—	—	—	—	—

LOCALITY		hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
ETESIOLAUS																			
439	catori	ALF	RA	#	kak	ANK	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
440	kyabobo	DRF	RA	#	ooo	ooo	bia	ooo	—	wli	KYA	—	—	—	—	—	—	—	—
STUGETA																			
441	marmoreus	SUD	NR	~	—	—	ooo	—	ooo	—	—	bom	bui	mol	gbe	dig	kog	ooo	shh
HYPOLYCAENA																			
443	philippus	GUI	CO	#	kak	ANK	bia	owa	BOA	WLI	KYA	bom	bui	MOL	GBE	dig	KOG	KAL	shh
444	kadiskos	MEF	RA	~	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
445	liara	MEF	RA	~	kak	ank	bia	ooo	—	wli	ooo	—	—	—	—	—	—	—	—
446	lebona	WEF	NR	#	KAK	ank	BIA	owa	ooo	WLI	KYA	—	—	—	—	—	—	—	—
447	clenchi	WEF	RA	#	KAK	ANK	BIA	OWA	ooo	WLI	kya	—	—	—	—	—	—	—	—
449	scintillans	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	bui	—	—	dig	—	KAL	—
450	dubia	ALF	CO	#	KAK	ANK	BIA	OWA	ooo	WLI	KYA	—	bui	—	—	dig	—	KAL	—
451	kakumi	MEF	CO	#	KAK	ANK	bia	OWA	ooo	WLI	kya	—	—	—	—	—	—	—	—
452	antifaunus	MEF	NR	#	KAK	ank	BIA	owa	BOA	WLI	KYA	—	—	—	—	—	—	—	—
453	hatita	MEF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	—	—	—	—	—	—	—
455	nigra	WEF	CO	#	KAK	ank	BIA	owa	ooo	WLI	kya	—	—	—	—	—	—	—	—
PILODEUDORIX																			
457	camerona	MEF	NR	#	KAK	ank	BIA	owa	ooo	WLI	kya	—	—	—	—	—	—	—	—
458	diyllus	MEF	NR	#	kak	ank	BIA	owa	ooo	WLI	KYA	—	ooo	—	—	dig	—	—	—
460	caerulea	GUI	NR	#	kak	ank	BIA	owa	BOA	wli	KYA	bom	bui	mol	gbe	dig	kog	kal	shh
461	zela	WEF	RA	#	kak	ank	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
462	catori	DRF	RA	#	kak	ank	bia	ooo	ooo	wli	KYA	—	—	—	—	—	—	—	—
467	otraeda	MEF	NR	#	KAK	ANK	bia	owa	ooo	wli	kya	—	—	—	—	—	—	—	—
468	leonina	MEF	NR	#	KAK	ank	bia	owa	ooo	wli	kya	—	—	—	—	—	—	—	—
469	virgata	MEF	RA	#	KAK	ANK	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
473	deritas	MEF	RA	~	ooo	ooo	ooo	ooo	—	ooo	ooo	—	—	—	—	—	—	—	—
474	aucta	MEF	RA	#	—	—	—	—	—	wli	KYA	—	—	—	—	—	—	—	—
475	pseudoderitas	MEF	RA	#	kak	ank	bia	owa	ooo	WLI	kya	—	—	—	—	—	—	—	—
476	laticlavia	MEF	RA	#	kak	ank	bia	ooo	—	WLI	ooo	—	—	—	—	—	—	—	—
477	aurivilliusi	WEF	RA	~	kak	ank	bia	ooo	—	ooo	ooo	—	—	—	—	—	—	—	—
478	kiellandi	WEF	RA	~	kak	ank	bia	ooo	—	ooo	ooo	—	—	—	—	—	—	—	—
479	corruscans	WEF	VR	#	KAK	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
480	violetta	WEF	RA	#	KAK	ank	bia	owa	—	—	—	—	—	—	—	—	—	—	—

LOCALITY		hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
481	fumata	WEF	VR	~	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
PARADEUDORIX																			
484	eleala	ALF	NR	#	KAK	ANK	BIA	owa	ooo	WLI	KYA	—	bui	—	—	—	—	—	—
487	moyambina	WEF	VR	~	kak	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
HYPOMYRINA																			
491	mimetica	MEF	RA	~	kak	ooo	bia	—	—	wli	—	—	—	—	—	—	—	—	—
492	nomion	DRF	NR	#	kak	ooo	bia	owa	BOA	wli	KYA	BOM	bui	MOL	ooo	DIG	kog	kal	SHH
DEUDORIX																			
494	antalus	GUI	CO	#	KAK	ank	bia	owa	BOA	wli	KYA	bom	bui	MOL	gbe	dig	KOG	KAL	SHH
495	livia	SUD	VR	~	—	—	—	—	—	—	—	—	—	mol	gbe	—	—	—	ooo
496	lorisona	ALF	NR	#	KAK	ank	BIA	owa	BOA	WLI	KYA	ooo	bui	ooo	—	ooo	kog	KAL	ooo
497	kayonza	WEF	RA	#	KAK	ank	BIA	—	—	ooo	—	—	—	—	—	—	—	—	—
498	dinochares	GUI	RA	#	ooo	ooo	bia	—	—	ooo	KYA	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo
499	dinomenes	DRF	RA	#	kak	ank	BIA	—	BOA	WLI	ooo	—	bui	—	—	—	—	—	—
500	odana	ALF	NR	#	kak	ank	bia	owa	BOA	WLI	KYA	—	—	—	—	—	—	—	—
501	galathea	ALF	NR	#	KAK	ANK	bia	owa	boa	wli	KYA	—	—	—	—	—	—	—	—
502	caliginosa	MEF	RA	#	kak	ank	bia	—	—	wli	KYA	—	—	—	—	—	—	—	—
CAPYS																			
506	vorgasi	SPE	VR	~	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
POLYOMMATINAE																			
ANTHENE																			
507	rubricinctus	MEF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	—	—	—	—	—	—	—
508	ligures	MEF	RA	#	kak	ank	bia	ooo	—	WLI	ooo	—	—	—	—	—	—	—	—
510	sylvanus	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	kya	—	ooo	—	—	—	—	KAL	—
512	liodes	ALF	NR	#	KAK	ANK	bia	owa	BOA	WLI	KYA	—	bui	—	—	dig	—	kal	—
513	definita	GUI	NR	#	KAK	ooo	bia	ooo	ooo	—	—	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo
514	princeps	GUI	NR	#	kak	ooo	BIA	ooo	ooo	wli	kya	bom	bui	ooo	ooo	dig	kog	kal	ooo
515	starki	GUI	RA	#	—	—	—	—	ooo	ooo	KYA	—	BUI	—	—	ooo	ooo	ooo	ooo
516	amarah	SUD	NR	#	ooo	ooo	bia	ooo	BOA	ooo	kya	bom	bui	mol	GBE	dig	kog	KAL	shh
517	lunulata	GUI	CO	#	KAK	ooo	bia	owa	BOA	wli	KYA	bom	bui	mol	gbe	DIG	KOG	kal	shh
518	kikuyu	GUI	RA	~	—	—	—	—	—	ooo	ooo	bom	ooo	mol	gbe	ooo	ooo	ooo	shh
519	talboti	SUD	VR	#	—	—	—	—	—	—	—	—	—	MOL	gbe	—	—	—	ooo
520	wilsoni	GUI	RA	~	—	—	—	—	—	wli	kya	—	—	—	—	—	—	—	—

LOCALITY		hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
521	levis	ALF	NR	#	KAK	ank	BIA	ooo	—	wli	KYA	—	ooo	—	—	—	—	—	—
522	irumu	ALF	NR	~	kak	ank	bia	—	ooo	wli	kya	—	ooo	mol	—	—	—	kal	—
523	larydas	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	bui	MOL	ooo	ooo	kog	KAL	ooo
524	crawshayi	GUI	NR	#	ooo	ooo	bia	ooo	BOA	ooo	KYA	bom	BUI	MOL	gbe	dig	kog	KAL	shh
525	lachares	MEF	NR	#	KAK	ank	BIA	owa	—	wli	ooo	—	—	—	—	—	—	—	—
527	lysicles	WEF	NR	#	KAK	ANK	bia	owa	—	wli	—	—	—	—	—	—	—	—	—
530	atewa	WEF	RA	~	kak	ank	ooo	—	—	—	—	—	—	—	—	—	—	—	—
532	radiata	WEF	VR	~	kak	ank	ooo	—	—	—	—	—	—	—	—	—	—	—	—
534	locuples	WEF	RA	#	kak	ank	bia	ooo	—	WLI	—	—	—	—	—	—	—	—	—
537	scintillula	WEF	RA	#	ooo	ank	BIA	—	—	ooo	—	—	—	—	—	—	—	—	—
538	helpsi	WEF	VR	~	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
539	juba	WEF	NR	#	KAK	ANK	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
NEURYPEXINA																			
540	lyzanius	MEF	CO	#	KAK	ANK	BIA	owa	ooo	WLI	KYA	—	—	—	—	—	—	—	—
NEURELLIPES																			
542	lusones	WEF	RA	#	KAK	ANK	bia	ooo	—	wli	—	—	—	—	—	—	—	—	—
543	chryseostictus	WEF	NR	#	KAK	ank	bia	owa	ooo	wli	KYA	—	—	—	—	—	—	—	—
544	fulvus	WEF	VR	#	KAK	ANK	ooo	—	—	—	—	—	—	—	—	—	—	—	—
545	staudingeri	WEF	VR	~	ooo	ank	ooo	—	—	—	—	—	—	—	—	—	—	—	—
546	gemmifera	DRF	RA	#	ooo	ooo	ooo	—	—	wli	KYA	—	—	—	—	ooo	ooo	ooo	—
TRICLEMA																			
547	rufoplagata	MEF	RA	~	ooo	ank	bia	—	—	ooo	—	—	—	—	—	—	—	—	—
548	lucretilis	MEF	NR	#	kak	ank	bia	ooo	—	ooo	KYA	—	—	—	—	—	—	—	—
549	lamias	ALF	NR	#	kak	ank	BIA	owa	BOA	WLI	kya	BOM	—	—	—	—	kog	kal	—
550	fasciatus	WEF	NR	#	KAK	ank	bia	owa	—	WLI	KYA	—	—	—	—	—	—	—	—
551	obscura	WEF	RA	~	kak	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
552	inconspicua	WEF	RA	#	KAK	ank	BIA	—	—	—	—	—	—	—	—	—	—	—	—
554	hades	MEF	NR	#	kak	ank	bia	owa	BOA	WLI	KYA	bom	bui	ooo	ooo	dig	kog	kal	ooo
555	phoenicis	DRF	RA	#	—	—	—	—	ooo	wli	KYA	ooo	ooo	mol	ooo	ooo	ooo	kal	shh
556	nigeriae	GUI	NR	#	ooo	ooo	bia	owa	boa	wli	KYA	bom	ooo	mol	gbe	dig	ooo	kal	shh
CUPIDESTHES																			
560	jacksoni	WEF	NR	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
561	mimetica	DRF	RA	~	ooo	ooo	ooo	—	—	ooo	ooo	—	—	—	—	—	—	—	—
562	lithas	MEF	NR	#	KAK	ANK	BIA	owa	ooo	wli	ooo	—	—	—	—	—	—	—	—

LOCALITY	hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
564 leonina	MEF	NR	#	KAK	ank	BIA	ooo	—	wli	—	—	—	—	—	—	—	—	—
564 pungusei	WEF	VR	#	KAK	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
PSEUDONACADUBA																		
565 sichela	GUI	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	bom	BUI	MOL	GBE	DIG	KOG	kal	shh
LAMPIDES																		
567 boeticus	UBQ	NR	#	kak	ANK	bia	OWA	BOA	wli	KYA	BOM	bui	MOL	gbe	dig	kog	kal	SHH
URANOTHAUMA																		
568 falkensteini	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	BOM	bui	—	—	dig	—	KAL	ooo
PHLYARIA																		
574 cyara	ALF	CO	#	KAK	ank	BIA	owa	boa	WLI	KYA	—	—	—	—	—	—	—	—
CACYREUS																		
575 lingeus	UBQ	CO	#	KAK	ank	BIA	owa	BOA	WLI	KYA	bom	BUI	mol	gbe	DIG	KOG	KAL	SHH
577 audeoudi	WEF	RA	~	kak	ank	bia	owa	ooo	wli	ooo	—	—	—	—	—	—	—	—
LEPTOTES																		
578 pirithous	UBQ	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
579 babaulti	GUI	NR	#	KAK	ank	bia	owa	boa	wli	KYA	bom	bui	mol	gbe	dig	kog	kal	shh
580 jeanneli	UBQ	CO	#	kak	ank	bia	owa	boa	wli	KYA	bom	bui	MOL	gbe	DIG	kog	kal	shh
581 brevidentatus	GUI	NR	#	kak	ank	bia	owa	boa	wli	kya	bom	bui	mol	gbe	dig	kog	kal	SHH
582 pulchra	SPE	RA	~	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo
TUXENTIUS																		
583 cretosus	SUD	CO	#	—	—	—	—	—	—	—	—	BUI	MOL	GBE	ooo	ooo	—	ooo
584 carana	ALF	CO	#	KAK	ANK	BIA	owa	boa	WLI	KYA	ooo	BUI	—	—	—	—	—	—
TARUCUS																		
586 ungemachi	SUD	NR	#	—	—	—	—	—	—	—	—	—	MOL	GBE	—	—	—	shh
588 rosacea	SUD	RA	#	—	—	—	—	—	—	—	—	—	MOL	gbe	—	—	—	—
ACTIZERA																		
592 lucida	GUI	EA	~	ooo	ooo	ooo	ooo	—	ooo	ooo	—	—	—	—	—	—	—	—
EICOCHRYSOPS																		
593 hippocrates	SPE	CO	#	KAK	ANK	BIA	owa	boa	WLI	KYA	BOM	bui	MOL	gbe	dig	KOG	kal	SHH
594 dudgeoni	GUI	NR	#	—	—	—	—	—	wli	KYA	bom	bui	MOL	gbe	dig	kog	kal	ooo
CUPIDOPSIS																		
595 jobates	SUD	RA	~	—	—	—	ooo	ooo	—	—	ooo	—	ooo	gbe	ooo	ooo	ooo	ooo
596 cissus	GUI	NR	#	ooo	ANK	bia	owa	ooo	WLI	kya	bom	bui	MOL	GBG	dig	KOG	kal	shh

LOCALITY		hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
EUCHRYSOPS																			
598	albistriata	GUI	NR	#	KAK	ooo	bia	ooo	BOA	wli	kya	bom	bui	mol	gbe	dig	KOG	KAL	shh
600	reducta	SUD	NR	#	—	—	—	—	ooo	ooo	KYA	ooo	ooo	MOL	GBE	ooo	ooo	ooo	ooo
601	malathana	UBQ	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	bom	bui	MOL	gbe	DIG	KOG	kal	SHH
604	osiris	GUI	CO	#	KAK	ank	bia	ooo	boa	wli	KYA	BOM	bui	mol	gbe	dig	KOG	KAL	SHH
605	barkeri	GUI	NR	#	—	—	bia	owa	boa	wli	KYA	bom	ooo	ooo	ooo	ooo	ooo	kal	ooo
606	sahelianus	SUD	NR	#	—	—	—	—	—	—	—	—	—	MOL	GBE	dig	ooo	ooo	ooo
LEPIDOCHRYSOPS																			
607	victoriae	GUI	RA	#	—	—	—	—	—	wli	KYA	ooo	ooo	mol	gbe	ooo	ooo	ooo	shh
608	parsimon	GUI	RA	#	ooo	ooo	bia	ooo	ooo	wli	KYA	ooo	bui	ooo	—	—	—	—	—
611	synchrematiza	GUI	RA	~	ooo	ooo	bia	—	ooo	wli	kya	ooo	ooo	mol	—	—	—	—	—
615	quassi	GUI	NR	~	ooo	ooo	bia	—	ooo	wli	kya	ooo	ooo	—	—	—	—	—	—
THERMONIPHAS																			
617	micylus	MEF	CO	#	KAK	ANK	BIA	owa	boa	WLI	KYA	bom	bui	—	—	—	—	KAL	—
OBORONIA																			
622	punctatus	MEF	CO	#	KAK	ANK	BIA	owa	boa	WLI	KYA	BOM	—	—	—	dig	—	kal	—
623	liberiana	WEF	NR	#	KAK	ANK	BIA	—	—	—	—	—	—	—	—	—	—	—	—
624	pseudopunctatus	MEF	NR	#	—	—	—	—	—	WLI	kya	—	—	—	—	—	—	—	—
625	guessfeldti	DRF	NR	#	KAK	ooo	BIA	owa	BOA	WLI	KYA	ooo	—	—	—	—	—	kal	—
626	ornata	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	ooo	—	—	—	—	—	KAL	—
AZANUS																			
627	ubaldus	SUD	RA	~	—	—	—	—	—	—	—	—	—	mol	gbe	—	—	—	—
628	jesous	SUD	RA	#	—	—	ooo	—	ooo	ooo	ooo	—	—	MOL	GBE	—	—	—	shh
629	moriqua	SUD	NR	#	—	—	bia	—	boa	ooo	KYA	—	BUI	MOL	gbe	—	KOG	—	—
630	mirza	UBQ	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	bom	bui	MOL	gbe	dig	KOG	KAL	shh
631	natalensis	GUI	RA	#	—	—	ooo	—	ooo	wli	kya	—	ooo	mol	GBG	—	—	KAL	—
632	isis	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	BOM	bui	—	—	dig	—	kal	—
CHILADES																			
633	eleusis	SUD	RA	~	—	—	—	—	—	—	—	—	—	ooo	gbe	—	—	—	—
634	trochylus	GUI	NR	#	ooo	ooo	bia	—	boa	wli	kya	ooo	ooo	mol	ooo	DIG	KOG	ooo	SHH
ZIZEERIA																			
635	knysna	UBQ	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH

LOCALITY	hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
ZIZINA																		
636 antanossa	GUI	NR	#	KAK	ANK	bia	—	ooo	wli	kya	bom	bui	mol	gbe	DIG	kog	kal	shh
ZIZULA																		
637 hylax	UBQ	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	bom	bui	mol	gbe	dig	kog	KAL	shh
RIODINIDAE																		
ABISARA																		
638 intermedia	WEF	VR	~	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
639 tantalus	WEF	VR	~	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
642 gerontes	WEF	RA	~	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
NYMPHALIDAE																		
LIBYTHEINAE																		
LIBYTHEA																		
646 labdaca	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	bui	—	—	—	—	ooo	—
DANAINAE																		
DANAUS																		
647 chrysippus	UBQ	VC	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
TIRUMALA																		
648 petiverana	GUI	CO	#	KAK	ank	BIA	OWA	BOA	WLI	KYA	bom	BUI	mol	GBE	dig	KOG	kal	SHH
AMAURIS																		
650 niavius	GUI	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	BOM	BUI	mol	ooo	DIG	KOG	KAL	shh
651 tartarea	ALF	NR	#	KAK	ANK	BIA	OWA	ooo	WLI	KYA	—	bui	—	—	dig	kog	kal	SHH
652 hecate	MEF	NR	#	kak	ANK	bia	owa	ooo	wli	KYA	—	—	—	—	ooo	—	ooo	ooo
653 damocles	DRF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	ooo	BUI	ooo	ooo	DIG	KOG	KAL	shh
SATYRINAE																		
GNOPHODES																		
656 betsimena	ALF	CO	#	KAK	ank	BIA	OWA	BOA	WLI	KYA	ooo	bui	ooo	—	dig	ooo	kal	—
657 chelys	ALF	CO	#	KAK	ANK	BIA	OWA	ooo	WLI	KYA	—	BUI	—	—	dig	ooo	kal	—
MELANITIS																		
658 leda	UBQ	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	bom	BUI	MOL	GBE	dig	KOG	KAL	shh
659 libya	UBQ	NR	#	KAK	ANK	bia	OWA	boa	wli	kya	bom	bui	MOL	gbe	dig	kog	kal	ooo
ELYMNIOPSIS																		
661 bammakoo	ALF	CO	#	KAK	ANK	BIA	OWA	ooo	WLI	KYA	—	ooo	—	—	ooo	—	ooo	—

LOCALITY		hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
BICYCLUS																			
663	xeneas	ALF	NR	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	—	—	—	—	—	—	—
665	evadne	WEF	NR	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
669	ephorus	WEF	RA	#	KAK	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
672	italus	WEF	NR	#	—	—	—	—	—	WLI	KYA	—	—	—	—	—	—	KAL	—
673	zinebi	ALF	NR	#	KAK	ANK	BIA	OWA	BOA	—	—	—	ooo	—	—	—	—	—	—
674	uniformis	WEF	RA	#	kak	ank	bia	—	—	wli	KYA	—	—	—	—	—	—	—	—
678	procora	WEF	NR	#	KAK	ANK	bia	OWA	—	wli	KYA	—	—	—	—	—	—	—	—
679	pavonis	GUI	CO	#	—	—	—	—	—	—	KYA	bom	BUI	MOL	GBE	—	—	—	—
680	milyas	GUI	NR	#	—	—	ooo	—	—	—	KYA	ooo	bui	MOL	gbe	—	—	—	—
681	trilophus	WEF	RA	#	ooo	ANK	ooo	—	—	—	—	—	—	—	—	—	—	—	—
682	ignobilis	ALF	RA	#	kak	ANK	BIA	—	—	—	—	—	—	—	—	—	—	—	—
683	maesseni	ALF	NR	#	ooo	ooo	ooo	ooo	—	WLI	KYA	—	—	—	—	—	—	—	—
684	nobilis	WEF	RA	#	kak	ANK	BIA	—	—	—	—	—	—	—	—	—	—	—	—
687	taenias	MEF	CO	#	KAK	ANK	BIA	OWA	boa	WLI	KYA	—	ooo	—	—	—	—	—	—
690	vulgaris	ALF	VC	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	BUI	MOL	GBE	DIG	kog	KAL	shh
691	dorothea	ALF	VC	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	—	—	—	—	—	—	—
692	sandace	ALF	VC	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	ooo	—	—	dig	KOG	KAL	—
693	sambulos	WEF	NR	#	KAK	ANK	BIA	ooo	ooo	—	—	—	—	—	—	—	—	—	—
694	sangmelinae	WEF	NR	#	KAK	ANK	BIA	OWA	ooo	wli	KYA	—	—	—	—	—	—	—	—
695	mandanes	DRF	NR	#	KAK	ooo	BIA	owa	BOA	WLI	KYA	—	bui	—	—	dig	ooo	kal	—
696	auricruda	MEF	RA	#	kak	ank	bia	ooo	—	wli	KYA	—	—	—	—	—	—	—	—
697	campa	GUI	NR	#	—	—	—	—	—	wli	KYA	—	—	mol	GBE	dig	kog	ooo	—
698	angulosa	GUI	CO	#	—	—	—	—	BOA	ooo	KYA	bom	BUI	—	—	DIG	KOG	KAL	shh
699	sylvicolus	WEF	NR	#	—	—	—	—	—	wli	KYA	—	—	—	—	—	—	—	—
700	abnormis	WEF	NR	#	KAK	ank	BIA	OWA	ooo	—	—	—	—	—	—	—	—	—	—
701	safitza	GUI	NR	#	kak	ooo	BIA	OWA	BOA	WLI	KYA	BOM	bui	mol	gbe	DIG	kog	KAL	SHH
702	funebris	DRF	CO	#	KAK	ank	BIA	OWA	boa	WLI	KYA	BOM	BUI	MOL	GBE	dig	KOG	kal	shh
704	dekeyseri	WEF	RA	#	KAK	ank	ooo	—	—	—	—	—	—	—	—	—	—	—	—
705	istaris	WEF	NR	#	ooo	ooo	bia	—	—	WLI	KYA	—	—	—	—	—	—	—	—
707	madetes	MEF	NR	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	ooo	—	—	ooo	—	ooo	—
709	martius	MEF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	bui	—	—	ooo	—	KAL	—

LOCALITY	hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
HALLELESIS																		
712 halyma	WEF	NR	#	KAK	ANK	BIA	OWA	—	—	—	—	—	—	—	—	—	—	—
HENOTESIA																		
713 elisi	DRF	RA	#	—	—	—	—	—	ooo	KYA	ooo	—	ooo	ooo	ooo	—	—	—
HETEROPSIS																		
714 peitho	WEF	RA	~	ooo	ank	ooo	—	—	—	—	—	—	—	—	—	—	—	—
YPTHIMA																		
715 asterope	SUD	RA	~	—	—	—	—	—	—	—	—	—	mol	gbe	—	—	—	ooo
716 condamini	GUI	CO	#	—	—	ooo	—	ooo	ooo	kya	bom	—	MOL	gbe	DIG	ooo	ooo	SHH
717 antennata	ALF	NR	#	—	—	—	—	—	—	—	ooo	BUI	MOL	GBE	ooo	kog	KAL	shh
718 vuattouxi	DRF	NR	#	—	—	ooo	—	BOA	—	—	bom	BUI	MOL	gbe	ooo	KOG	kal	ooo
719 doleta	ALF	VC	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	ooo	ooo	ooo	dig	KOG	KAL	ooo
721 pupillaris	GUI	NR	#	—	—	ooo	—	boa	ooo	kya	—	bui	MOL	ooo	DIG	KOG	KAL	ooo
722 impura	GUI	RA	#	—	—	ooo	—	ooo	—	—	—	bui	MOL	ooo	ooo	KOG	ooo	ooo
YPTHIMOMORPHA																		
724 itonia	SPE	NR	#	kak	ank	bia	OWA	BOA	wli	KYA	bom	bui	MOL	GBE	DIG	KOG	KAL	ooo
CHARAXINAE																		
CHARAXES																		
725 varanes	GUI	CO	#	KAK	ANK	bia	OWA	BOA	WLI	KYA	bom	BUI	MOL	gbe	DIG	KOG	kal	SHH
726 fulvescens	ALF	NR	#	KAK	ANK	bia	owa	ooo	wli	KYA	—	—	—	—	dig	—	ooo	—
728 candiope	GUI	RA	~	ooo	ooo	bia	ooo	ooo	wli	kya	ooo	ooo	—	—	dig	ooo	kal	ooo
729 protoclea	ALF	CO	#	KAK	ANK	BIA	owa	ooo	WLI	KYA	ooo	bui	—	—	dig	kog	KAL	SHH
730 boueti	DRF	NR	#	KAK	ANK	bia	owa	ooo	wli	kya	ooo	ooo	—	—	dig	kog	kal	—
731 cynthia	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	wli	KYA	—	—	—	—	—	—	—	—
732 lucretius	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	ooo	—	—	—	—	—	—
733 lactetinctus	GUI	RA	#	—	—	ooo	—	ooo	ooo	KYA	bom	ooo	ooo	ooo	ooo	KOG	ooo	ooo
734 epijasius	GUI	CO	#	—	—	bia	—	ooo	ooo	KYA	bom	BUI	MOL	GBE	DIG	KOG	kal	SHH
736 castor	DRF	NR	#	KAK	ANK	bia	owa	ooo	WLI	KYA	—	bui	MOL	gbe	dig	KOG	ooo	SHH
737 brutus	MEF	CO	#	KAK	ANK	bia	owa	BOA	wli	KYA	bom	bui	MOL	ooo	dig	KOG	kal	SHH
738 pollux	MEF	RA	~	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
740 eudoxus	ALF	VR	~	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
741 tiridates	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	—	dig	kog	ooo	SHH
742 bipunctatus	WEF	NR	#	KAK	ANK	BIA	OWA	—	—	—	—	—	—	—	—	—	—	—

LOCALITY		hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
743	numenes	ALF	NR	#	KAK	ANK	BIA	owa	—	wli	kya	bom	—	—	—	dig	—	—	SHH
744	smaragdalis	ALF	NR	#	kak	ANK	bia	owa	—	—	—	—	—	—	—	—	—	—	—
745	imperialis	ALF	RA	#	kak	ANK	bia	—	—	wli	kya	—	—	—	—	—	—	—	—
746	ameliae	ALF	NR	#	KAK	ANK	BIA	owa	ooo	wli	KYA	—	—	—	—	—	—	—	—
747	pythodoris	DRF	VR	~	ooo	ooo	bia	—	—	—	—	—	—	—	—	—	—	—	—
748	hadrianus	WEF	RA	#	ooo	ANK	bia	—	—	—	—	—	—	—	—	—	—	—	—
750	nobilis	WEF	VR	~	—	ank	ooo	—	—	—	—	—	—	—	—	—	—	—	—
752	fournierae	WEF	VR	~	—	ooo	—	—	—	—	—	—	—	—	—	—	—	—	—
753	zingha	MEF	NR	#	KAK	ANK	bia	owa	BOA	WLI	KYA	—	—	—	—	—	—	—	—
754	etesipe	DRF	NR	#	KAK	ANK	bia	owa	BOA	WLI	KYA	—	—	—	—	—	—	—	—
755	achaemenes	GUI	CO	#	—	—	ooo	—	ooo	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	kal	SHH
756	eupale	ALF	VC	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	—	—	—	—	—	—	—
757	subornatus	WEF	RA	#	kak	ank	bia	—	—	WLI	KYA	—	—	—	—	—	—	—	—
758	anticlea	ALF	NR	#	KAK	ank	bia	owa	BOA	wli	kya	—	—	—	—	—	—	—	—
759	hildebrandti	MEF	RA	#	kak	ank	bia	owa	—	—	—	—	—	—	—	—	—	—	—
760	etheocles	ALF	CO	#	KAK	ANK	BIA	owa	boa	wli	kya	BOM	bui	MOL	—	dig	ooo	KAL	SHH
762	petersi	MEF	VR	~	kak	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
765	bocqueti	WEF	VR	~	kak	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
767	virilis	MEF	NR	#	KAK	ank	bia	owa	—	wli	kya	—	—	—	—	—	—	kal	—
768	cedreatis	MEF	NR	#	KAK	ANK	bia	owa	boa	WLI	kya	—	—	—	—	dig	—	kal	SHH
769	plantroui	DRF	RA	#	—	—	ooo	—	BOA	ooo	kya	—	—	ooo	ooo	ooo	ooo	—	—
770	viola	SUD	CO	#	—	—	ooo	—	ooo	ooo	KYA	bom	BUI	MOL	GBE	DIG	ooo	kal	ooo
771	northcotti	GUI	RA	#	—	—	ooo	—	BOA	wli	kya	bom	—	MOL	ooo	ooo	ooo	—	ooo
772	pleione	ALF	CO	#	KAK	ANK	BIA	OWA	ooo	WLI	kya	—	—	—	—	—	—	—	—
773	paphianus	WEF	NR	#	KAK	ank	bia	ooo	—	wli	KYA	—	—	—	—	—	—	—	—
774	nichetes	DRF	RA	#	kak	ANK	bia	owa	ooo	wli	kya	ooo	ooo	ooo	ooo	ooo	ooo	kal	—
775	porthos	MEF	RA	~	kak	ank	bia	owa	—	wli	—	—	—	—	—	—	—	—	—
776	zelica	WEF	RA	#	kak	ANK	bia	ooo	—	—	ooo	—	—	—	—	—	—	—	—
777	lycurgus	ALF	CO	#	KAK	ANK	bia	owa	BOA	WLI	KYA	—	—	—	—	—	—	—	—
778	mycerina	WEF	RA	#	kak	ANK	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—
779	doubledayi	WEF	RA	#	kak	ank	ooo	owa	—	WLI	KYA	—	—	—	—	—	—	—	—
EUXANTHE																			
780	eurinome	MEF	NR	#	KAK	ANK	bia	owa	ooo	wli	KYA	—	ooo	—	—	—	—	—	SHH

LOCALITY		hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
PALLA																			
783	violinitens	MEF	NR	#	KAK	ank	BIA	ooo	ooo	wli	ooo	—	—	—	—	—	—	—	—
784	decius	MEF	NR	#	KAK	ank	bia	OWA	BOA	WLI	ooo	—	—	—	—	—	—	—	—
785	ussheri	ALF	CO	#	KAK	ANK	BIA	owa	boa	wli	ooo	—	—	—	—	—	—	—	—
786	publius	MEF	NR	#	KAK	ank	bia	ooo	ooo	—	—	—	—	—	—	—	—	—	—
APATURINAE																			
APATUROPSIS																			
786a	cleochares	MEF	RA	#	KAK	ank	BIA	—	—	wli	ooo	—	—	—	—	—	—	—	—
NYMPHALINAE																			
KALLIMOIDES																			
787	rumia	ALF	CO	#	KAK	ANK	BIA	owa	ooo	WLI	KYA	—	—	—	—	—	—	—	—
VANESSULA																			
788	milca	WEF	RA	~	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
ANTANARTIA																			
789	delius	MEF	CO	#	KAK	ANK	BIA	owa	ooo	WLI	ooo	—	—	—	—	—	—	—	—
VANESSA																			
791	cardui	UBQ	NR	#	kak	ANK	BIA	owa	BOA	wli	KYA	bom	bui	MOL	gbe	dig	kog	kal	shh
PRECIS																			
792	octavia	GUI	NR	**#**	kak	ank	bia	owa	BOA	wli	KYA	bom	BUI	mol	GBE	dig	kog	KAL	shh
793	antilope	GUI	NR	**#**	kak	ooo	BIA	owa	BOA	WLI	KYA	bom	bui	MOL	GBE	dig	kog	kal	shh
796	ceryne	SPE	NR	#	kak	ooo	BIA	ooo	—	ooo	KYA	—	ooo	—	—	—	ooo	—	—
797	pelarga	ALF	NR	#	KAK	ANK	BIA	owa	ooo	WLI	KYA	bom	BUI	—	—	—	KOG	KAL	SHH
798	sinuata	WEF	RA	#	KAK	ANK	bia	—	—	—	—	—	—	—	—	—	—	—	—
HYPOLIMNAS																			
801	misippus	UBQ	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	mo;	GBE	DIG	KOG	kal	SHH
802	anthedon	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	ooo	—	ooo	KOG	kal	ooo
803	dinarcha	WEF	NR	#	KAK	ANK	bia	ooo	ooo	WLI	ooo	—	—	—	—	—	—	—	—
806	salmacis	MEF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	bui	—	—	—	KOG	—	—
SALAMIS																			
808	cacta	MEF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	ooo	—	—	—	—	—	—

LOCALITY		hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
PROTOGONIOMORPHA																			
809	cytora	MEF	NR	#	KAK	ANK	bia	ooo	ooo	WLI	KYA	BOM	bui	—	—	—	ooo	—	—
811	parhassus	MEF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	ooo	—	—	—	kog	kal	—
812	anacardii	DRF	NR	#	KAK	ooo	bia	ooo	BOA	WLI	KYA	bom	BUI	—	—	dig	KOG	KAL	—
JUNONIA																			
813	orithya	SUD	CO	#	ooo	ooo	bia	ooo	BOA	WLI	KYA	ooo	ooo	MOL	GBE	ooo	kog	ooo	SHH
814	oenone	UBQ	VC	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	gbe	DIG	KOG	KAL	SHH
815	hierta	SUD	CO	#	ooo	ooo	bia	ooo	BOA	wli	KYA	bom	ooo	MOL	GBE	DIG	KOG	ooo	SHH
816	cymodoce	MEF	NR	#	KAK	ANK	BIA	OWA	ooo	WLI	KYA	—	—	—	—	—	—	—	—
817	westermanni	DRF	NR	#	ooo	ank	BIA	ooo	—	ooo	ooo	—	—	—	—	—	—	—	—
818	hadrope	DRF	RA	~	—	—	—	—	—	ooo	ooo	—	—	—	—	—	—	—	—
819	sophia	ALF	CO	#	KAK	ANK	BIA	OWA	boa	WLI	KYA	ooo	bui	—	—	dig	ooo	kal	SHH
820	stygia	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	BUI	—	—	—	—	ooo	—
822	chorimene	GUI	CO	#	ooo	ooo	bia	owa	BOA	WLI	KYA	bom	BUI	MOL	GBE	DIG	kog	kal	SHH
823	terea	ALF	VC	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	bom	BUI	MOL	ooo	DIG	KOG	KAL	SHH
CATACROPTERA																			
824	cloanthe	GUI	NR	#	ooo	ooo	bia	owa	boa	wli	KYA	bom	BUI	mol	gbe	dig	KOG	KAL	shh
CYRESTINAE																			
CYRESTIS																			
825	camillus	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	BUI	—	—	—	—	—	—
BIBLIDINAE																			
BYBLIA																			
826	anvatara	UBQ	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	bom	BUI	MOL	GBE	dig	KOG	KAL	SHH
827	ilithyia	SUD	RA	~	—	—	—	—	—	—	—	—	—	mol	gbe	—	—	—	—
MESOXANTHA																			
828	ethosea	MEF	NR	#	KAK	ANK	BIA	owa	ooo	WLI	KYA	—	—	—	—	—	—	—	—
ARIADNE																			
829	enotrea	ALF	VC	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	bui	—	—	dig	kog	kal	—
830	albifascia	ALF	NR	#	KAK	ANK	BIA	owa	ooo	WLI	KYA	—	—	—	—	—	—	KAL	—
NEPTIDOPSIS																			
833	ophione	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	bui	—	—	—	—	—	—

LOCALITY		hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
EURYTELA																			
834	dryope	DRF	NR	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	bom	bui	ooo	—	dig	KOG	KAL	ooo
836	hiarbas	MEF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	—	—	—	—	—	—	—
SEVENIA																			
837	occidentalium	ALF	NR	#	kak	ANK	bia	OWA	BOA	ooo	ooo	—	—	—	—	—	—	—	—
838	boisduvali	ALF	NR	#	kak	ank	bia	owa	ooo	wli	KYA	—	—	—	—	—	—	—	—
839	umbrina	DRF	NR	#	—	—	ooo	—	—	wli	KYA	—	—	—	—	—	—	—	—
LIMENITIDINAE																			
HARMA																			
843	theobene	MEF	CO	#	KAK	ANK	BIA	OWA	BOA	wli	KYA	—	—	—	—	—	—	—	—
CYMOTHOE																			
846	fumana	MEF	CO	#	KAK	ANK	BIA	owa	ooo	—	—	—	—	—	—	—	—	—	—
851	egesta	MEF	CO	#	KAK	ANK	BIA	owa	BOA	ooo	—	—	—	—	—	—	—	—	—
853	lurida	WEF	VR	~	ooo	ank	ooo	—	—	—	—	—	—	—	—	—	—	—	—
858	aubergeri	MEF	NR	#	KAK	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
859	herminia	MEF	RA	#	ooo	ANK	bia	—	—	—	—	—	—	—	—	—	—	—	—
860	weymeri	WEF	RA	#	ooo	ank	BIA	—	—	—	—	—	—	—	—	—	—	—	—
863	caenis	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	BOM	BUI	—	—	dig	KOG	kal	—
866	althea	MEF	NR	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
868	jodutta	WEF	CO	#	KAK	ANK	ooo	owa	—	—	—	—	—	—	—	—	—	—	—
872	coccinata	MEF	NR	#	ooo	ooo	bia	ooo	—	WLI	KYA	—	—	—	—	—	—	—	—
873	mabillei	MEF	CO	#	KAK	ank	BIA	owa	BOA	—	—	—	—	—	—	—	—	—	—
878	‘sangaris’	WEF	NR	~	ooo	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
PSEUDONEPTIS																			
879	bugandensis	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	—	—	—	—	—	—	—
PSEUDACRAEA																			
880	eurytus	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	BUI	—	—	dig	KOG	KAL	—
884	boisduvalii	DRF	NR	#	kak	ANK	BIA	owa	BOA	WLI	kya	—	BUI	—	—	—	—	—	—
887	lucretia	ALF	CO	#	KAK	ANK	bia	owa	BOA	WLI	KYA	ooo	BUI	—	—	dig	KOG	KAL	—
888	warburgi	MEF	NR	#	KAK	ooo	BIA	owa	ooo	—	—	—	—	—	—	—	—	—	—
889	hostilia	WEF	RA	#	ooo	ANK	ooo	—	—	—	—	—	—	—	—	—	—	—	—
900	semire	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	ooo	—	—	ooo	—	ooo	—

LOCALITY		hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
NEPTIS																			
901	nemetes	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	bui	—	—	—	—	—	—
903	metella	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	BUI	—	—	—	—	—	—
905	serena	DRF	NR	#	KAK	ooo	BIA	owa	boa	wli	KYA	bom	BUI	MOL	gbe	dig	kog	kal	shh
906	kiriakoffi	DRF	NR	#	kak	ANK	bia	owa	boa	wli	KYA	bom	BUI	MOL	GBE	dig	kog	kal	SHH
907	morosa	GUI	CO	#	KAK	ank	BIA	owa	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
908	loma	MEF	RA	~	ooo	ooo	ooo	—	—	ooo	ooo	—	—	—	—	—	—	—	—
910	angusta	MEF	VR	~	—	—	—	—	—	ooo	ooo	—	—	—	—	—	—	—	—
911	alta	MEF	NR	#	KAK	ANK	bia	owa	ooo	WLI	KYA	—	—	—	—	—	—	—	—
912	seeldrayersi	MEF	RA	#	kak	ank	bia	owa	ooo	ooo	KYA	—	—	—	—	—	—	ooo	—
913	puella	MEF	NR	#	kak	ANK	BIA	owa	—	WLI	KYA	—	—	—	—	—	—	—	—
914	conspicua	MEF	RA	~	kak	ooo	ooo	—	—	ooo	ooo	—	—	—	—	—	—	—	—
915	najo	MEF	RA	#	KAK	ank	BIA	ooo	ooo	wli	KYA	—	ooo	—	—	—	—	ooo	—
916	metanira	MEF	RA	#	kak	ANK	BIA	—	—	ooo	ooo	—	—	—	—	—	—	—	—
917	continuata	MEF	???	~	kak	ooo	ooo	—	—	ooo	ooo	—	—	—	—	—	—	—	—
918	nysiades	MEF	NR	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	ooo	—	—	—	KOG	—	—
921	nicomedes	MEF	RA	#	KAK	ANK	BIA	owa	ooo	wli	KYA	—	—	—	—	—	—	—	—
922	quintilla	MEF	RA	#	KAK	ANK	BIA	ooo	ooo	wli	ooo	—	—	—	—	—	—	—	—
926	paula	WEF	RA	#	KAK	ank	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
927	strigata	MEF	RA	#	KAK	ank	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
929	nicoteles	MEF	CO	#	KAK	ANK	BIA	owa	ooo	WLI	KYA	—	—	—	—	—	—	KAL	
930	nicobule	MEF	NR	#	KAK	ANK	bia	owa	—	—	—	—	—	—	—	—	—	—	—
931	mixophyes	WEF	RA	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
933	nebrodes	MEF	NR	#	KAK	ANK	bia	owa	—	WLI	KYA	—	—	—	—	—	—	—	—
934	trigonophora	MEF	NR	#	KAK	ank	bia	OWA	BOA	WLI	KYA	—	BUI	—	—	—	—	—	—
936	agouale	ALF	VC	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	bui	—	—	—	—	kal	—
937	melicerta	MEF	CO	#	KAK	ank	BIA	OWA	BOA	WLI	KYA	BOM	BUI	—	—	—	—	KAL	—
938	troundi	MEF	CO	#	KAK	ANK	BIA	OWA	BOA	wli	KYL	—	—	—	—	—	—	—	—
CATUNA																			
941	crithea	ALF	VC	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	bom	bui	—	—	—	—	KAL	—
942	niji	WEF	RA	#	—	ANK	ooo	—	—	—	—	—	—	—	—	—	—	—	—
943	oberthueri	ALF	CO	#	KAK	ANK	BIA	owa	ooo	???	???	—	—	—	—	—	—	—	—
944	angustatum	MEF	CO	#	KAK	ooo	BIA	owa	ooo	WLI	KYA	—	—	—	—	—	—	KAL	—

LOCALITY		hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
EURYPHURA																			
946	togoensis	MEF	NR	#	KAK	ank	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
948	chalcis	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	—	—	—	dig	—	KAL	—
HAMANUMIDA																			
951	daedalus	GUI	CO	#	KAK	ANK	BIA	ooo	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
ATERICA																			
953	galene	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	BUI	—	—	dig	KOG	KAL	—
CYNANDRA																			
954	opis	MEF	NR	#	KAK	ANK	bia	owa	—	WLI	KYA	—	—	—	—	—	—	—	—
EURIPHENE																			
959	incerta	WEF	RA	#	KAK	ANK	bia	—	—	ooo	ooo	—	—	—	—	—	—	—	—
960	barombina	ALF	VC	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	bui	—	—	dig	—	kal	
961	veronica	WEF	CO	#	—	ANK	—	—	—	—	—	—	—	—	—	—	—	—	—
964	grosesmithi	MEF	RA	#	KAK	ank	ooo	—	—	—	—	—	—	—	—	—	—	—	—
968	simplex	WEF	NR	#	KAK	ANK	BIA	OWA	—	—	—	—	—	—	—	—	—	—	—
974	amicia	MEF	NR	#	KAK	ank	BIA	owa	boa	WLI	KYA	—	—	—	—	—	—	—	—
976	aridatha	MEF	NR	#	KAK	ANK	BIA	OWA	BOA	wli	KYA	—	—	—	—	—	—	—	—
978	coerulea	WEF	CO	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
985	ernestibaumanni	WEF	RA	~	ooo	ooo	ooo	—	—	wli	ooo	—	—	—	—	—	—	—	—
986	gambiae	ALF	CO	#	KAK	ANK	BIA	owa	ooo	—	—	—	—	—	—	—	—	—	—
987	ampedusa	ALF	NR	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	bui	—	—	—	—	KAL	—
988	leonis	WEF	VR	~	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
989	atossa	MEF	NR	#	KAK	ANK	BIA	owa	ooo	ooo	—	—	—	—	—	—	—	—	—
990	doriclea	MEF	NR	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
BEBEARIA																			
994	lucayensis	MEF	RA	#	KAK	ANK	bia	ooo	ooo	wli	KYA	—	—	—	—	—	—	—	—
995	tentyris	MEF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	bui	—	—	dig	—	—	—
996	osyris	WEF	NR	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
998	carshena	MEF	NR	#	KAK	ank	bia	owa	—	wli	ooo	—	—	—	—	—	—	—	—
999	absolon	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	—	—	—	—	—	—	—
1001	zonara	MEF	CO	#	KAK	ooo	BIA	OWA	BOA	WLI	ooo	—	—	—	—	—	—	—	—
1002	mandinga	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	—	—	—	—	—	—	—
1003	oxione	MEF	NR	#	KAK	ANK	bia	OWA	BOA	WLI	ooo	—	—	—	—	—	—	—	—
1004	abesa	MEF	NR	#	KAK	ank	BIA	OWA	—	ooo	ooo	—	—	—	—	—	—	—	—

LOCALITY	hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
1006 barce	WEF	RA	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
1008 mardania	ALF	CO	#	KAK	ANK	BIA	OWA	boa	WLI	KYA	—	—	—	—	—	—	—	—
1011 cocalia	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	bui	—	—	dig	—	KAL	—
1012 paludicola	MEF	NR	#	KAK	ANK	BIA	owa	ooo	—	—	—	—	—	—	—	—	—	—
1014 sophus	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	bui	—	—	dig	—	kal	—
1017 arcadius	WEF	RA	#	ooo	ANK	ooo	—	—	—	—	—	—	—	—	—	—	—	—
1021 laetitia	WEF	CO	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
1027 phantasina	ALF	CO	#	KAK	ANK	BIA	owa	—	WLI	KYA	—	—	—	—	—	—	—	—
1029 demetra	MEF	RA	#	kak	ank	BIA	—	—	ooo	ooo	—	—	—	—	—	—	—	—
1033 maledicta	WEF	VR	~	kak	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
1035 ashantina	WEF	RA	#	KAK	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
1037 cutteri	WEF	RA	#	KAK	ANK	ooo	—	—	—	—	—	—	—	—	—	—	—	—
EUPHAEDRA																		
Subgenus Medoniana																		
1046 medon	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	—	—	dig	kog	KAL	SHH
Subgenus Gausapia																		
1047 gausape	WEF	NR	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
1047 mariaechristinae	WEF	NR	#	KAK	ANK	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
Subgenus Xypetana																		
1055 xypete	MEF	CO	#	KAK	ANK	BIA	OWA	—	wli	KYA	—	—	—	—	—	—	—	—
1057 hebes	WEF	NR	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
1059 diffusa	DRF	NR	#	ooo	—	bia	OWA	BOA	wli	KYA	—	bui	—	—	dig	—	KAL	—
1060 crossei	DRF	RA	#	—	—	—	—	BOA	—	—	—	—	—	—	—	—	—	—
1061 crockeri	MEF	NR	#	KAK	ooo	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
Subgenus Radia																		
1062 eusemoides	WEF	VR	~	—	ooo	—	—	—	—	—	—	—	—	—	—	—	—	—
Subgenus Euphaedra																		
1064 cyparissa	DRF	NR	#	KAK	ank	BIA	ooo	ooo	ooo	ooo	—	BUI	—	—	—	—	—	—
1065 sarcoptera	MEF	NR	#	KAK	ooo	BIA	ooo	BOA	ooo	ooo	—	—	—	—	—	—	—	—
Subgenus Euphaedrana																		
1066 themis	DRF	NR	#	KAK	ANK	bia	OWA	boa	WLI	KYA	—	bui	MOL	—	dig	—	KAL	—
1067 laboureana	WEF	RA	#	KAK	ANK	bia	ooo	BOA	—	—	—	—	—	—	—	—	—	—
1071 minuta	WEF	RA	#	KAK	ANK	bia	—	—	—	—	—	—	—	—	—	—	—	—
1072 modesta	WEF	NR	#	KAK	ANK	bia	—	—	—	—	—	—	—	—	—	—	—	—

LOCALITY	hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
1075 janetta	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	BUI	MOL	—	dig	—	KAL	—
1076 splendens	WEF	RA	~	ooo	ooo	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—
1077 aberrans	WEF	VR	~	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
1078 vetusta	WEF	VR	#	KAK	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
1083 ceres	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	bui	—	—	dig	—	KAL	—
1085 phaethusa	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	bui	—	—	dig	—	KAL	—
1086 inanum	MEF	RA	#	KAK	ooo	BIA	OWA	ooo	ooo	ooo	—	—	—	—	—	—	—	—
1096 ignota	WEF	VR	#	KAK	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
1106 francina	WEF	NR	#	KAK	ANK	ooo	—	—	—	—	—	—	—	—	—	—	—	—
1108 eleus	WEF	NR	#	KAK	ANK	BIA	owa	—	—	—	—	—	—	—	—	—	—	—
1112 zampa	WEF	NR	#	KAK	ANK	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
1115 edwardsii	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA		BUI	—	—	—	—	—	—
1116 ruspina	WEF	NR	#	—	—	—	—	—	WLI	ooo	—	—	—	—		—	—	—
1117 perseis	WEF	NR	#	KAK	ANK	BIA	owa	—	—	—	—	—	—	—	—	—	—	—
1118 harpalyce	ALF	VC	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	BUI	—	—	dig	kog	KAL	—
1119 eupalus	WEF	RA	#	KAK	ANK	BIA	OWA	—	ooo	ooo	—	—	—	—	—	—	—	—
EUPTERA																		
1121 crowleyi	ALF	RA	~	kak	ank	bia	ooo	—	ooo	ooo	—	—	—	—	—	—	—	—
1122 elabontas	ALF	NR	#	kak	ank	bia	ooo	—	WLI	KYA	—	—	—	—	—	—	—	—
1123 dorothea	MEF	VR	#	—	ANK	ooo	—	—	—	—	—	—	—	—	—	—	—	—
1124 zowa	ALF	NR	#	kak	ank	bia	owa	ooo	WLI	KYA	—	—	—	—	—	—	—	—
PSEUDATHYMA																		
1133 falcata	MEF	RA	#	KAK	ank	bia	owa	—	WLI	ooo	—	—	—	—	—	—	—	—
1134 sibyllina	MEF	RA	#	KAK	ank	BIA	ooo	BOA	—	—	—	—	—	—	—	—	—	—
HELICONIINAE																		
ACRAEA																		
Subgenus Actinote																		
1139 perenna	MEF	NR	#	ooo	ooo	ooo	—	—	WLI	ooo	—	—	—	—	—	—	—	—
1144 circeis	ALF	CO	#	KAK	ANK	BIA	owa	BOA	wli	KYA	BOM	—	—	—	—	—	—	—
1147 translucida	MEF	NR	#	—	—	—	—	—	WLI	ooo	—	—	—	—	—	—	—	—
1148 peneleos	ALF	NR	#	kak	ANK	BIA	owa	BOA	WLI	KYA	—	—	—	—	—	—	—	—
1149 parrhasia	MEF	NR	#	KAK	ANK	BIA	owa	—	WLI	ooo	—	—	—	—	—	—	—	—

LOCALITY		hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
1150	orina	MEF	RA	#	kak	ANK	BIA	ooo	—	WLI	KYA	—	—	—	—	—	—	—	—
1152	pharsalus	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	BOM	bui	—	—	dig	ooo	kal	—
1153	encedon	UBQ	CO	#	KAK	ANK	BIA	owa	BOA	wli	KYA	bom	BUI	MOL	GBE	dig	kog	kal	SHH
1154	encedana	SPE	NR	~	kak	ooo	ooo	ooo	ooo	ooo	kya	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo
1155	alciope	ALF	VC	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	ooo	—	—	DIG	kog	KAL	—
1156	aurivillii	ALF	NR	#	KAK	ANK	BIA	owa	ooo	ooo	ooo	—	—	—	—	—	—	—	—
1157	jodutta	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	—	—	—	—	—	KAL	SHH
1158	lycoa	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	BUI	—	—	DIG	kog	KAL	SHH
1159	serena	UBQ	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
1160	acerata	ALF	NR	#	KAK	ank	bia	owa	boa	wli	KYA	—	BUI	—	—	dig	ooo	KAL	—
1161	pseudepaea	WEF	RA	~	kak	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
1165	bonasia	ALF	CO	#	KAK	ANK	bia	owa	BOA	WLI	KYA	BOM	bui	—	—	DIG	—	KAL	—
1167	orestia	MEF	RA	#	kak	ANK	bia	ooo	ooo	wli	kya	—	—	—	—	—	—	—	SHH
1168	polis	MEF	NR	#	KAK	ANK	bia	owa	ooo	WLI	KYA	—	—	—	—	—	—	—	—
1169	vesperalis	WEF	VR	~	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
Subgenus Acraea																			
1172	kraka	WEF	RA	~	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1173	rogersi	WEF	NR	#	KAK	ank	bia	owa	ooo	WLI	ooo	—	—	—	—	—	—	—	—
1174	abdera	MEF	RA	#	ooo	ank	bia	owa	BOA	WLI	ooo	—	—	—	—	—	—	—	—
1176	egina	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	kya	bom	bui	ooo	ooo	dig	kog	KAL	SHH
1178	pseudegina	UBQ	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	ooo	bui	mol	ooo	DIG	KOG	KAL	ooo
1179	caecilia	SUD	CO	#	—	—	bia	owa	BOA	wli	KYA	bom	BUI	MOL	GBE	dig	kog	kal	ooo
1180	zetes	DRF	NR	#	KAK	ANK	BIA	owa	boa	WLI	KYA	ooo	bui	ooo	ooo	dig	ooo	kal	SHH
1181	endoscota	ALF	RA	#	KAK	ANK	BIA	owa	ooo	WLI	KYA	—	—	—	—	—	—	—	—
1182	leucographa	MEF	NR	#	KAK	ank	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
1184	quirina	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	BUI	—	—	ooo	KOG	kal	—
1185	neobule	UBQ	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	bom	bui	mol	GBE	DIG	KOG	KAL	SHH
1186	eugenia	DRF	NR	#	—	—	—	—	—	WLI	KYA	—	—	—	—	—	—	—	—
1187	camaena	DRF	RA	#	ooo	—	bia	ooo	BOA	—	—	—	—	—	—	ooo	—	—	—
1188	vestalis	ALF	NR	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	ooo	—	—	—	—	—	—
1189	macaria	WEF	RA	#	KAK	ANK	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—
1190	umbra	MEF	NR	#	KAK	ANK	BIA	OWA	boa	WLI	kya	—	ooo	—	—	dig	ooo	KAL	—
1191	alcinoe	MEF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	ooo	—	—	—	—	—	—
1192	consanguinea	WEF	RA	#	kak	ANK	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—

LOCALITY	hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
1196 *epaea*	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	BUI	—	—	dig	KOG	KAL	SHH
LACHNOPTERA																		
1199 anticlia	MEF	CO	#	KAK	ANK	BIA	owa	ooo	WLI	kya	—	—	—	—	—	—	—	—
PHALANTA																		
1200 phalantha	UBQ	CO	#	KAK	ooo	bia	owa	BOA	WLI	KYA	BOM	BUI	mol	GBE	DIG	KOG	KAL	SHH
1201 *eurytis*	MEF	CO	#	KAK	ANK	BIA	owa	ooo	WLI	KYA	—	—	—	—	—	—	—	—
HESPERIIDAE																		
COLIADINAE																		
COELIADES																		
1203 chalybe	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	—	—	—	—	—	—
1204 bixana	MEF	RA	~	kak	ank	bia	ooo	—	ooo	—	—	—	—	—	—	—	—	—
1206 libeon	ALF	NR	~	kak	ank	bia	ooo	ooo	wli	kya	—	—	—	—	dig	—	—	—
1207 forestan	UBQ	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	bom	bui	—	—	dig	KOG	KAL	—
1208 pisistratus	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	BUI	—	—	dig	KOG	kal	SHH
1209 hanno	MEF	NR	#	KAK	ank	BIA	owa	BOA	WLI	KYA	—	BUI	—	—	dig	KOG	—	—
PYRRHIADES																		
1210 lucagus	DRF	CO	#	—	—	—	—	—	—	—	BOM	—	—	—	—	—	—	SHH
PYRRHOCHALCIA																		
1211 iphis	ALF	CO	#	KAK	ANK	BIA	owa	ooo	wli	kya	—	bui	—	—	—	—	KAL	SHH
PYRGINAE																		
LOXOLEXIS																		
1212 holocausta	WEF	VR	#	ooo	ANK	ooo	—	—	—	—	—	—	—	—	—	—	—	—
1213 dimidia	WEF	VR	#	ooo	ank	BIA	—	—	—	—	—	—	—	—	—	—	—	—
1214 hollandi	WEF	RA	#	kak	ANK	BIA	—	—	—	—	—	—	—	—	—	—	—	—
KATREUS																		
1215 johnstonii	WEF	RA	#	ooo	ANK	bia	—	—	—	—	—	—	—	—	—	—	—	—
CELAENORRHINUS																		
1216 rutilans	WEF	RA	~	ooo	ank	ooo	—	—	—	—	—	—	—	—	—	—	—	—
1217 sagamase	WEF	VR	#	KAK	ank	ooo	—	—	—	—	—	—	—	—	—	—	—	—
1219 leona	WEF	RA	~	ooo	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
1223 ankasa	WEF	VR	#	ooo	ANK	ooo	—	—	—	—	—	—	—	—	—	—	—	—
1224 galenus	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	BUI	—	—	dig	—	KAL	—

LOCALITY	hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
1225 cf galenus	WEF	RA	#	kak	ank	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—
1226 meditrina	WEF	RA	~	kak	ank	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
1227 ovalis	WEF	RA	#	KAK	ank	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
1230 proxima	ALF	CO	#	KAK	ank	BIA	owa	BOA	WLI	KYA	—	—	—	—	—	—	—	—
1231 plagiatus	MEF	NR	#	KAK	ANK	BIA	OWA	ooo	WLI	KYA	—	—	—	—	—	—	—	—
TAGIADES																		
1232 flesus	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	bom	BUI	mol	GBE	DIG	kog	KAL	SHH
EAGRIS																		
1233 denuba	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	BOM	bui	—	—	dig	kog	kal	—
1234 decastigma	WEF	RA	~	ooo	ank	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—
1235 tigris	WEF	RA	#	ooo	ank	ooo	ooo	—	WLI	KYA	—	—	—	—	—	—	—	—
1236 subalbida	WEF	RA	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
1237 hereus	MEF	NR	#	KAK	ANK	BIA	ooo	—	wli	ooo	—	—	—	—	—	—	—	—
1238 tetrastigma	MEF	NR	#	KAK	ank	BIA	ooo	ooo	WLI	kya	—	—	—	—	—	—	—	—
CALLEAGRIS																		
1239 lacteus	WEF	NR	#	kak	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
PROCAMPTA																		
1241 rara	MEF	NR	#	KAK	ank	BIA	owa	ooo	wli	KYA	—	—	—	—	—	—	—	—
ERETIS																		
1242 lugens	GUI	CO	#	—	—	ooo	ooo	ooo	wli	KYA	bom	bui	MOL	GBG	dig	ooo	ooo	ooo
1243 plistonicus	ALF	NR	#	KAK	ANK	bia	owa	BOA	WLI	KYA	—	bui	—	—	ooo	—	kal	—
1244 melania	DRF	NR	#	ooo	ooo	BIA	owa	boa	WLI	KYA	bom	BUI	ooo	—	dig	kog	KAL	—
SARANGESA																		
1245 laelius	GUI	NR	#	—	—	ooo	—	BOA	—	KYA	bom	BUI	MOL	GBG	DIG	KOG	shh	—
1246 phidyle	SUD	NR	~	—	—	—	—	—	—	—	—	—	ooo	gbe	—	—	—	—
1247 tertullianus	MEF	NR	#	KAK	ANK	BIA	owa	boa	WLI	kya	—	—	—	—	—	—	—	—
1248 majorella	MEF	NR	#	kak	ank	BIA	owa	BOA	WLI	KYA	—	—	—	—	—	—	—	—
1249 tricerata	MEF	NR	#	ooo	ooo	BIA	ooo	BOA	wli	KYA	—	—	—	—	dig	—	—	—
1250 thecla	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	ooo	bui	—	—	dig	kog	KAL	—
1251 bouvieri	DRF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	bui	—	—	dig	kog	kal	—
1252 brigida	MEF	NR	#	KAK	ANK	bia	owa	ooo	WLI	KYA	—	—	—	—	—	—	—	—

LOCALITY	hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
CAPRONA																		
1253 adelica	GUI	RA	#	—	—	ooo	—	boa	ooo	KYA	bom	bui	mol	ooo	DIG	KOG	kal	shh
1254 pillaana	SUD	VR	#	—	—	—	—	—	—	—	—	—	ooo	GBE	—	—	—	shh
NETROBALANE																		
1255 canopus	GUI	RA	~	—	—	—	—	—	—	ooo	—	—	—	—	—	—	—	shh
ABANTIS																		
1256 bismarcki	GUI	RA	#	—	—	—	—	—	ooo	KYA	—	—	—	—	dig	—	ooo	—
1257 leucogaster	WEF	RA	~	kak	ank	bia	ooo	—	ooo	—	—	—	—	—	—	—	—	—
1258 nigeriana	GUI	NR	#	ooo	ooo	bia	—	boa	ooo	KYA	—	bui	mol	GBE	dig	ooo	kal	SHH
1259 pseudonigeriana	SUD	RA	#	—	—	—	—	—	ooo	KYA	bom	—	—	gbe	—	—	kal	—
1261 lucretia	MEF	RA	#	kak	ank	bia	ooo	ooo	WLI	KYA	—	—	—	—	—	—	—	—
1262 elegantula	DRF	RA	#	kak	ank	bia	ooo	—	ooo	KYA	—	—	—	—	—	—	—	—
1263 ja	WEF	VR	~	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
1263 tanobia	WEF	VR	#	ooo	ank	BIA	—	—	—	—	—	—	—	—	—	—	—	—
SPIALIA																		
1265 spio	SUD	CO	#	ooo	ooo	bia	ooo	boa	WLI	KYA	bom	bui	mol	gbe	dig	KOG	kal	shh
1267 diomus	SUD	NR	#	ooo	ooo	bia	ooo	BOA	wli	KYA	bom	bui	mol	gbe	dig	kog	kal	shh
1268 dromus	GUI	NR	#	ooo	ooo	bia	ooo	BOA	wli	KYA	bom	bui	MOL	gbe	dig	kog	kal	shh
1269 ploetzi	ALF	NR	#	KAK	ank	bia	owa	BOA	WLI	KYA	—	ooo	—	—	dig	ooo	KAL	—
GOMALIA																		
1270 elma	DRF	NR	#	ooo	ooo	BIA	ooo	BOA	WLI	KYA	bom	bui	mol	ooo	dig	kog	kal	SHH
HESPERIINAE																		
ASTICTOPTERUS																		
1276 anomoeus	WEF	NR	~	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
1277 abjecta	GUI	CO	#	—	—	bia	—	ooo	WLI	KYA	bom	bui	mol	ooo	DIG	KOG	KAL	ooo
PROSOPALPUS																		
1278 debilis	MEF	RA	#	kak	ANK	bia	ooo	ooo	ooo	ooo	—	bui	—	—	dig	—	KAL	—
1279 styla	DRF	NR	#	ooo	ooo	bia	OWA	ooo	WLI	ooo	—	—	—	—	—	—	—	—
1280 saga	WEF	RA	#	kak	ANK	BIA	—	—	—	—	—	—	—	—	—	—	—	—
KEDESTES																		
1282 protensa	GUI	VR	#	—	—	—	—	—	—	—	—	—	MOL	gbe	ooo	—	—	—

LOCALITY	hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
GORGYRA																		
1284 aretina	ALF	NR	#	KAK	ANK	bia	owa	BOA	wli	KYA	—	bui	—	—	—	—	—	—
1285 heterochrus	MEF	NR	#	KAK	ANK	bia	ooo	ooo	wli	ooo	—	—	—	—	—	—	—	—
1286 mocquerysii	ALF	NR	#	KAK	ank	bia	owa	ooo	wli	KYA	—	ooo	—	—	ooo	ooo	KAL	—
1287 aburae	WEF	RA	~	kak	ank	bia	ooo	—	wli	—	—	—	—	—	—	—	—	—
1289 bina	MEF	NR	#	KAK	ank	bia	owa	BOA	wli	—	—	—	—	—	—	—	—	—
1290 sola	MEF	RA	~	kak	ank	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—
1291 afikpo	MEF	VR	~	kak	ank	bia	ooo	—	wli	—	—	—	—	—	—	—	—	—
1292 diversata	MEF	NR	#	kak	ANK	BIA	owa	BOA	wli	ooo	—	ooo	—	—	kal	ooo	KAL	—
1293 bule	MEF	RA	~	kak	ooo	bia	owa	ooo	wli	ooo	—	—	—	—	—	—	—	—
1294 minima	DRF	NR	#	kak	ooo	bia	ooo	BOA	wli	KYA	ooo	bui	ooo	—	DIG	KOG	kal	shh
1295 sara	ALF	NR	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	—	—	—	—	—	—	—
1296 subfacatus	ALF	NR	#	KAK	ank	bia	ooo	ooo	wli	KYA	—	ooo	—	—	dig	—	KAL	—
1297 pali	MEF	RA	#	kak	ANK	BIA	ooo	—	wli	ooo	—	—	—	—	—	—	—	—
GYROGRA																		
1299 subnotata	ALF	NR	#	KAK	ANK	bia	owa	boa	WLI	KYA	—	ooo	—	—	dig	ooo	KAL	—
CERATRICHIA																		
1301 phocion	MEF	CO	#	KAK	ANK	BIA	owa	ooo	—	—	—	—	—	—	—	—	—	—
1302 semilutea	MEF	RA	#	KAK	ank	BIA	ooo	ooo	wli	—	—	—	—	—	—	—	—	—
1303 clara	WEF	NR	#	KAK	ank	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
1305 crowleyi	WEF	RA	#	—	ANK	—	—	—	—	—	—	—	—	—	—	—	—	—
1306 nothus	WEF	NR	#	KAK	ANK	BIA	owa	ooo	WLI	KYA	—	—	—	—	—	—	—	—
1307 argyrosticta	WEF	NR	#	kak	ANK	BIA	OWA	—	wli	—	—	—	—	—	—	—	—	—
1308 maesseni	WEF	RA	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
TENIORHINUS																		
1309 watsoni	MEF	RA	#	kak	ANK	bia	owa	—	—	—	—	—	—	—	—	—	—	—
1310 ignita	MEF	NR	~	ooo	ooo	bia	owa	—	—	—	—	—	—	—	—	—	—	—
PARDALEODES																		
1311 incerta	GUI	CO	#	ooo	ooo	BIA	owa	BOA	wli	KYA	bom	BUI	—	—	dig	KOG	KAL	SHH
1312 edipus	ALF	VC	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	bui	—	—	dig	kog	kal	—
1313 sator	MEF	NR	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	ooo	—	—	—	—	ooo	—
1314 tibullus	MEF	NR	#	KAK	ANK	BIA	owa	BOA	wli	KYA	—	—	—	—	—	—	—	—
1315 xanthopeplus	WEF	VR	~	ooo	ank	ooo	—	—	—	—	—	—	—	—	—	—	—	—

LOCALITY	hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
XANTHODISCA																		
1317 rega	ALF	NR	#	KAK	ank	BIA	OWA	BOA	wli	KYA	—	—	—	—	—	—	—	—
1318 astrape	MEF	NR	#	KAK	ank	BIA	OWA	BOA	WLI	KYA	—	—	—	—	—	—	—	—
PAROSMODES																		
1320 morantii	SUD	RA	#	—	—	—	—	—	—	KYA	—	—	mol	gbe	—	—	—	SHH
1321 lentiginosa	ALF	RA	#	ooo	ooo	BIA	ooo	ooo	WLI	KYA	—	ooo	—	—	dig	—	kal	—
RHABDOMANTIS																		
1322 galatia	MEF	NR	#	KAK	ank	BIA	owa	ooo	wli	KYA	—	—	—	—	—	—	—	—
1323 sosia	MEF	NR	#	KAK	ank	BIA	owa	BOA	WLI	KYA	—	—	—	—	—	—	—	—
OSMODES																		
1324 laronia	ALF	CO	#	KAK	ANK	BIA	owa	boa	WLI	KYA	—	—	—	—	—	—	—	—
1325 omar	DRF	NR	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	bui	—	—	dig	—	KAL	—
1326 lux	WEF	NR	#	KAK	ANK	bia	ooo	ooo	wli	KYA	—	—	—	—	—	—	—	—
1328 thora	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	BOM	bui	—	—	dig	—	kal	—
1329 distincta	WEF	RA	~	kak	ank	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
1330 adon	WEF	RA	#	KAK	ank	BIA	ooo	ooo	WLI	KYA	—	—	—	—	—	—	—	—
1332 adosus	WEF	RA	#	KAK	ank	BIA	—	—	—	—	—	—	—	—	—	—	—	—
1333 lindseyi	MEF	NR	#	kak	ank	BIA	owa	BOA	WLI	KYA	—	—	—	—	—	—	—	—
1334 costatus	WEF	RA	#	KAK	ank	ooo	—	—	—	—	—	—	—	—	—	—	—	—
1335 banghaasi	WEF	RA	#	KAK	ANK	ooo	—	—	—	—	—	—	—	—	—	—	—	—
OSPHANTES																		
1336 ogowena	WEF	VR	#	KAK	ank	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
PARACLEROS																		
1337 placidus	MEF	NR	#	KAK	ank	BIA	owa	BOA	WLI	kya	—	bui	—	—	ooo	—	kal	—
1338 biguttulus	ALF	CO	#	KAK	ANK	BIA	OWA	ooo	WLI	KYA	—	bui	—	—	dig	—	kal	—
1339 substrigata	MEF	RA	#	KAK	ank	BIA	ooo	ooo	wli	KYA	—	—	—	—	—	—	—	—
1340 maesseni	MEF	NR	#	KAK	ank	bia	owa	ooo	wli	kya	—	—	—	—	—	—	—	—
ACLEROS																		
1341 ploetzi	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	ooo	BUI	—	—	—	—	kal	
1342 mackenii	ALF	CO	#	KAK	ANK	bia	owa	boa	WLI	KYA	ooo	BUI	—	—	—	—	KAL	—
1343 nigrapex	MEF	NR	#	KAK	ANK	bia	ooo	ooo	wli	ooo	—	—	—	—	—	—	—	—
1344 bala	MEF	RA	#	KAK	ooo	ooo	ooo	—	wli	—	—	—	—	—	—	—	—	—

LOCALITY	hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
SEMALEA																		
1345 pulvina	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	bui	—	—	dig	—	kal	—
1346 sextilis	WEF	NR	#	KAK	ANK	bia	owa	ooo	wli	—	—	—	—	—	—	—	—	—
1347 atrio	WEF	RA	#	KAK	ank	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
1349 arela	DRF	NR	#	KAK	ooo	BIA	ooo	ooo	wli	KYA	—	ooo	—	—	dig	—	kal	—
HYPOLEUCIS																		
1350 ophiusa	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	bui	—	—	ooo	—	kal	—
1351 tripunctata	MEF	NR	#	kak	ank	BIA	ooo	ooo	WLI	KYA	—	—	—	—	—	—	—	—
1352 sophia	WEF	RA	#	KAK	ank	BIA	—	—	—	—	—	—	—	—	—	—	—	—
MEZA																		
1353 indusiata	MEF	NR	#	KAK	ANK	bia	owa	boa	wli	KYA	—	ooo	—	—	ooo	—	ooo	—
1354 meza	ALF	VC	#	KAK	ANK	BIA	OWA	boa	WLI	KYA	—	bui	—	—	dig	—	KAL	—
1355 mabea	MEF	VR	~	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
1356 leucophaea	MEF	NR	#	KAK	ANK	BIA	ooo	ooo	wli	kya	—	—	—	—	—	—	—	—
1357 elba	MEF	RA	#	KAK	ank	BIA	ooo	ooo	wli	kya	—	—	—	—	—	—	—	—
1358 mabillei	WEF	RA	#	kak	ANK	BIA	ooo	ooo	—	—	—	—	—	—	—	—	—	—
1359 cybeutes	ALF	NR	#	KAK	ANK	bia	owa	—	wli	KYA	—	—	—	—	—	—	—	—
PARONYMUS																		
1361 xanthias	WEF	RA	#	KAK	ANK	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
1363 ligora	MEF	NR	#	KAK	ank	BIA	owa	BOA	WLI	ooo	—	ooo	—	—	ooo	—	ooo	—
1364 nevea	WEF	VR	#	ooo	ANK	ooo	—	—	—	—	—	—	—	—	—	—	—	—
ANDRONYMUS																		
1365 neander	ALF	NR	#	kak	ank	BIA	owa	boa	wli	KYA	ooo	bui	—	—	dig	kog	kal	—
1367 caesar	ALF	CO	#	KAK	ANK	BIA	owa	BOA	wli	KYA	ooo	bui	—	—	dig	KOG	KAL	—
1368 hero	MEF	NR	#	KAK	ank	bia	owa	BOA	WLI	KYA	—	—	—	—	—	—	—	—
1369 helles	MEF	NR	#	KAK	ANK	bia	owa	ooo	wli	kya	—	—	—	—	—	—	—	—
1370 evander	MEF	NR	#	KAK	ANK	bia	owa	ooo	WLI	KYA	—	—	—	—	—	—	—	—
ZOPHOPETES																		
1373 ganda	DRF	RA	~	ooo	ooo	ooo	—	—	ooo	—	—	—	—	—	—	—	—	—
1374 cerymica	ALF	NR	#	KAK	ank	bia	owa	BOA	wli	KYA	—	bui	—	—	dig	—	kal	—
1376 quaternata	DRF	RA	~	ooo	ooo	ooo	ooo	ooo	—	—	—	—	ooo	—	—	—	—	—
GAMIA																		
1377 buchholzi	WEF	NR	#	kak	ANK	bia	owa	ooo	WLI	KYA	—	—	—	—	—	—	—	—
1378 shelleyi	WEF	NR	#	KAK	ANK	bia	owa	ooo	WLI	kya	—	—	—	—	—	—	—	—

LOCALITY	hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
ARTITROPA																		
1379 comus	MEF	NR	~	kak	ank	bia	ooo	ooo	wli	KYA	—	—	—	—	—	—	—	—
MOPALA																		
1380 orma	MEF	RA	#	KAK	ank	BIA	ooo	BOA	wli	KYA	—	—	—	—	—	—	—	—
GRETNA																		
1381 waga	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	bom	bui	—	—	dig	kog	kal	—
1383 cylinda	ALF	NR	#	KAK	ANK	BIA	ooo	BOA	wli	KYA	—	—	—	—	—	—	—	—
1386 balenge	MEF	RA	#	KAK	ank	bia	—	—	ooo	ooo	—	—	—	—	—	—	—	—
PTEROTEINON																		
1387 laufella	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	—	bui	—	—	dig	—	KAL	—
1388 iricolor	WEF	RA	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
1389 laterculus	WEF	RA	#	KAK	ank	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
1390 capronnieri	WEF	VR	#	ooo	ANK	ooo	—	—	—	—	—	—	—	—	—	—	—	—
1391 caenira	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	—	—	—	—	—	—	—
1392 ceucaenira	WEF	RA	#	KAK	ANK	BIA	owa	ooo	WLI	ooo	—	—	—	—	—	—	—	—
1393 concaenira	WEF	RA	#	KAK	ANK	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—
1394 pruna	WEF	RA	#	KAK	ank	bia	ooo	—	ooo	ooo	—	—	—	—	—	—	—	—
LEONA																		
1395 binoevatus	WEF	RA	#	KAK	ank	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
1397 lota	WEF	VR	#	ooo	ANK	ooo	—	—	—	—	—	—	—	—	—	—	—	—
1399 leonora	WEF	RA	#	kak	ank	bia	ooo	—	wli	KYA	—	—	—	—	—	—	—	—
1401 stoehri	WEF	RA	#	KAK	ank	bia	—	—	ooo	KYA	—	—	—	—	—	—	—	—
1402 meloui	WEF	RA	~	kak	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
1403 halma	WEF	???	~	???	???	???	—	—	—	—	—	—	—	—	—	—	—	—
1405 luehderi	WEF	RA	~	ooo	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
CAENIDES																		
1406 soritia	WEF	RA	#	kak	ANK	bia	owa	ooo	WLI	KYA	—	—	—	—	—	—	—	—
1407 kangvensis	MEF	NR	#	KAK	ANK	BIA	owa	boa	WLI	KYA	—	—	—	—	—	—	—	—
1408 xychus	MEF	RA	#	KAK	ank	ooo	—	—	—	—	—	—	—	—	—	—	—	—
1409 benga	WEF	RA	~	kak	ank	ooo	—	—	—	—	—	—	—	—	—	—	—	—
1410 otilia	WEF	RA	#	kak	ANK	ooo	—	—	—	—	—	—	—	—	—	—	—	—
1411 dacenilla	MEF	RA	#	kak	ANK	ooo	—	—	—	—	—	—	—	—	—	—	—	—
1412 dacela	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	—	bui	—	—	dig	—	kal	—
1413 hidarioides	WEF	RA	#	KAK	ank	BIA	ooo	—	—	—	—	—	—	—	—	—	—	—

LOCALITY	hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
1414 dacena	MEF	CO	#	KAK	ANK	bia	owa	BOA	WLI	KYA	—	—	—	—	—	—	—	—
MONZA																		
1415 alberti	ALF	VC	#	KAK	ANK	BIA	OWA	BOA	WLI	kya	—	—	—	—	—	—	—	—
1416 cretacea	ALF	CO	#	KAK	ANK	BIA	owa	BOA	WLI	KYA	bom	bui	—	—	dig	KOG	KAL	
MELPHINA																		
1417 noctula	WEF	RA	#	KAK	ANK	BIA	—	—	wli	KYA	—	—	—	—	—	—	—	—
1419 unistriga	WEF	NR	#	KAK	ank	BIA	owa	BOA	WLI	KYA	—	—	—	—	—	—	—	—
1420 tarace	MEF	RA	~	ooo	ank	bia	ooo	ooo	ooo	ooo	—	—	—	—	—	—	—	—
1421 flavina	MEF	RA	#	kak	ank	bia	ooo	ooo	wli	KYA	—	—	—	—	—	—	—	—
1422 statirides	MEF	NR	~	kak	ank	bia	ooo	ooo	wli	kya	—	—	—	—	—	—	—	—
1423 statira	WEF	RA	~	ooo	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
1425 malthina	WEF	RA	#	KAK	ANK	bia	ooo	ooo	—	—	—	—	—	—	—	—	—	—
1426 maximiliani	MEF	RA	~	ooo	ooo	ooo	—	—	—	—	—	—	—	—	—	—	—	—
FRESNA																		
1427 netopha	DRF	NR	#	kak	ooo	bia	OWA	BOA	WLI	KYA	bom	bui	—	—	dig	—	kal	—
1428 maesseni	MEF	RA	~	—	—	—	—	—	wli	kya	—	—	—	—	—	—	—	—
1429 nyassae	DRF	RA	#	kak	ooo	bia	owa	boa	wli	kya	bom	bui	—	—	dig	kog	kal	
1430 cojo	ALF	NR	#	kak	ank	bia	owa	BOA	wli	KYA	—	—	—	—	—	—	—	—
1431 carlo	MEF	VR	#	KAK	ank	bia	—	—	—	—	—	—	—	—	—	—	—	—
PLATYLESCHES																		
1432 galesa	ALF	NR	#	kak	ANK	BIA	owa	boa	wli	kya	ooo	bui	mol	ooo	dig	kog	kal	ooo
1434 moritili	GUI	NR	#	ooo	ooo	bia	ooo	BOA	wli	KYA	bom	bui	MOL	gbe	dig	kog	kal	shh
1435 rossi	DRF	VR	~	ooo	ooo	bia	—	ooo	wli	ooo	ooo	ooo	ooo	—	ooo	ooo	—	—
1437 picanini	ALF	NR	#	KAK	ANK	BIA	owa	BOA	wil	kya	—	ooo	—	—	dig	KOG	kal	—
1438 lamba	MEF	RA	~	ooo	ooo	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
1439 affinissima	DRF	NR	~	ooo	ooo	bia	ooo	ooo	—	—	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo
1440 chamaeleon	DRF	NR	~	ooo	ooo	bia	—	ooo	ooo	ooo	ooo	ooo	mol	ooo	ooo	ooo	ooo	ooo
1441 batangae	DRF	RA	~	—	—	—	—	—	—	—	—	—	ooo	ooo	—	—	—	ooo
PELOPIDAS																		
1444 mathias	UBQ	CO	#	kak	ANK	BIA	owa	BOA	wli	KYA	bom	BUI	MOL	GBE	DIG	KOG	kal	SHH
1445 thrax	UBQ	CO	#	kak	ank	BIA	owa	BOA	wli	KYA	bom	BUI	MOL	GBE	dig	kog	kal	shh
BORBO																		
1446 fallax	GUI	NR	#	kak	ooo	bia	ooo	BOA	wli	KYA	bom	bui	MOL	gbe	DIG	kog	kal	SHH
1447 fanta	GUI	NR	#	KAK	ANK	bia	owa	BOA	WLI	kya	BOM	bui	mol	ooo	DIG	kog	kal	shh

LOCALITY		hab	ra	np	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
1448	perobscura	GUI	NR	#	KAK	ank	BIA	ooo	BOA	WLI	KYA	bom	BUI	MOL	GBE	dig	KOG	KAL	SHH
1449	micans	SPE	RA	#	kak	ank	BIA	ooo	BOA	WLI	ooo	ooo	ooo	mol	—	dig	kog	kal	shh
1450	borbonica	GUI	NR	#	ooo	ooo	bia	ooo	BOA	wli	KYA	ooo	ooo	mol	gbe	dig	kog	ooo	shh
1451	gemella	GUI	NR	#	kak	ooo	BIA	owa	BOA	WLI	KYA	bom	bui	MOL	GBE	DIG	kog	kal	shh
1452	binga	WEF	RA	#	KAK	ank	bia	ooo	—	—	—	—	—	—	—	—	—	—	—
1453	fatuellus	ALF	CO	#	KAK	ANK	BIA	OWA	BOA	WLI	KYA	BOM	bui	MOL	gbe	DIG	KOG	KAL	SHH
1454	holtzi	GUI	NR	#	ooo	—	ooo	ooo	BOA	wli	kya	bom	ooo	mol	gbe	dig	kog	kal	shh
PARNARA																			
1456	monasi	GUI	RA	~	kak	ank	bia	ooo	ooo	wli	kya	ooo	bui	mol	ooo	dig	kog	kal	—
GEGENES																			
1457	‘pumilio’	SUD	NR	~	—	—	—	—	—	—	—	—	—	mol	gbe	ooo	ooo	—	ooo
1459	niso	GUI	NR	#	KAK	ooo	bia	ooo	ooo	ooo	kya	bom	bui	MOL	gbe	dig	kog	kal	ooo
1460	hottentota	DRF	NR	#	ooo	ooo	bia	ooo	ooo	wli	KYA	bom	bui	MOL	GBE	DIG	kog	ooo	ooo

APPENDIX 1B THE BUTTERFLIES OF OTHER LOCALITIES IN GHANA

Torben B. Larsen, February 2006

Numbers: The numbering refers to the book *Butterflies of West Africa – origins, natural history, diversity, conservation* – Missing number beong to West African species not found in Ghana.

Legends:

The following three-letter codes are used:
ATE = Atewa Range Forest Reserve
TOF = Tano Ofin Forest Reserve
3PT = Cape Three Points Forest Reserve
ABU = Aburi Botanical Gardens
BOB = Bobiri Butterfly Sanctuary
BUN = Bunso Arboretum and Butterfly Sanctuary
GAM = Gambaga Scarp and White Volta

CAPITAL letters imply that the species has been authoritatively recorded from the locality e.g. ATE
lower case letters imply that the species is almost certain to occur in the locality e.g. ate
ooo implies that the species might occur in the locality
–– implies that the species does not occur in the locality
• not predictable

LOCALITIES subspecies hab ra ATE TOF KRO 3PT ABU BOB BUN GAM

All species are roughly allocated to a main habitat type. Many butterflies are quite flexible in their requirements and the classification is still a rough guide.

WEF implies that the species is centered on Wet Evergreen Forest
MEF implies that the species is centered on Moist Forests
DRF implies that the species is centered on Drier Semi-deciduous and marginal forests
ALF implies that the species is found in any type of forest
GUI implies that the species is centered on the Guinea Savannah
SUD implies that the species is centered on the Sudan Savannah
SPE implies that the species is found in special habitats
UBQ species that are practically ubiquitous through all habitats in most of Africa

The species are roughly graded by rarity, though this is always a difficult call to make. Very rare species may one day be numerous in a single locality. Very common butterflies are sometimes absent. However, the following notations are used:

VC = very common – species that are usually found on any visit to a suitable locality
CO = common – species that are usually found on 75% of visits to most suitable localities
NR = not rare – met with frequently but often not common
RA = rare – species that are usually found on 75% of visits to most suitable localities
VR = very rare – species that are usually found on less than 5% of visits to most suitable localities

ww = endemic to Africa west of the Dahomey Gap
en = endemic to the Ghana subregion of West Africa
vo = endemic to the Volta Region of Ghana and Togo

! = species collected by T.B. Larsen in Ghana
@ = species collected during present mission

NOTE Authors and dates of description are found in Larsen (2005).

LOCALITIES		subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
PAPILIONIDAE															
PAPILIO															
1	antimachus	antimachus	WEF	VR	ATE	ooo	ooo	ooo	—	BOB	—	—			
2	zalmoxis		WEF	VR	ooo	ooo	ooo	ooo	—	—	—	—			
4	dardanus	dardanus	ALF	NR	ATE	TOF	KRO	3PT	ABU	BOB	BUN	ooo	@		!
5	phorcas	phorcas	ALF	RA	ATE	TOF	kro	3PT	ABU	ooo	•	—			!
7	horribilis		WEF	NR	ATE	ooo	ooo	ooo	—	—	—	—		ww	!
9	chrapkowskoides	nurettini	MEF	CO	ATE	tof	kro	3pt	ABU	bob	BUN	—	@		!
10	sosia	sosia	ALF	NR	ATE	tof	kro	3pt	ABU	bob	•	—			!
11	nireus	nireus	ALF	CO	ATE	TO5	KRO	3pt	ABU	BOB	BUN	gam	@		!
12	menestheus	menestheus	WEF	CO	ATE	TO5	KRO	3PT	ABU	BOB	•	—	@		!
13	demodocus	demodocus	UBQ	VC	ATE	TO5	KRO	3PT	ABU	BOB	BUN	GAM	@		!
15	cyproeofila	cyproeofila	MEF	CO	ATE	tof	KRO	3PT	ABU	BOB	BUN	—	@		!
16	zenobia		MEF	NR	ATE	TO5	kro	3PT	—	BOB	•	—	@		!
17	nobicea		MEF	NR	—	—	—	—	—	—	—	—		vo	!
18	cynorta	cynorta	MEF	NR	ATE	tof	KRO	3PT	ABU	bob	•	—			!
GRAPHIUM															
20	angolanus	baronis	GUI	CO	ATE	tof	kro	3pt	abu	bob	•	GAM	@		!
22	tynderaeus		WEF	RA	ATE	ooo	ooo	—	—	—	—	—			!
23	latreillianus	latreillianus	WEF	NR	ATE	TOF	kro	ooo	—	—	—	—			!
24	almansor	carchedonius	DRF	NR	—	—	—	—	—	—	—	—			!
25	adamastor		DRF	NR	ooo	—	kro	—	ABU	ooo	•	gam	@		!
26	agamedes		DRF	RA	—	—	—	—	—	ooo	•	ooo			
28	rileyi		WEF	RA	ATE	ooo	—	ooo	—	—	•	—		en	
29	leonidas	leonidas	UBQ	CO	ATE	tof	KRO	3PT	ABU	BOB	•	GAM	@		!
30	illyris	illyris	WEF	NR	ATE	tof	kro	ooo	—	—	—	—			!
31	policenes		ALF	CO	ATE	tof	KRO	3PT	ABU	BOB	•	ooo	@		!
32	liponesco		WEF	NR	ate	TO5	kro	3pt	abu	BOB	•	—			!
34	antheus		ALF	NR	ATE	tof	kro	3pt	ABU	bob	•	ooo			!
PIERIDAE															
PSEUDOPONTIINAE															
PSEUDOPONTIA															
35	paradoxa	paradoxa	WEF	NR	ooo	ooo	ooo	ooo	—	—	—	—			!

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM		
COLIADINAE													
CATOPSILIA													
36 florella		UBQ	VC	ATE	TO5	KRO	3PT	ABU	BOB	BUN	GAM	@	!
EUREMA													
38 senegalensis		MEF	CO	ATE	TO5	KRO	3PT	ABU	BOB	BUN	—	@	!
39 hecabe	solifera	UBQ	VC	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM	@	!
40 floricola	leonis	UBQ	NR	ATE	tof	KRO	3pt	abu	BOB	•	gam	@	!
41 hapale		SPE	VR	ate	tof	kro	ooo	—	ooo	•	ooo		
42 desjardinsii	regularis	UBQ	NR	ate	tof	kro	3pt	ABU	bob	•	GAM	@	!
43 brigitta	brigitta	GUI	NR	ATE	TOF	KRO	ooo	ABU	BOB	•	GAM	@	!
PIERINAE													
PINACOPTERYX													
44 eriphia	tritogenia	SUD	NR	—	—	—	—	—	—	—	GAM		
NEPHERONIA													
45 argia	argia	ALF	CO	ATE	TO5	KRO	3PT	ABU	BOB	BUN	—	@	!
46 thalassina	thalassina	ALF	CO	ATE	TO5	KRO	3pt	ooo	BOB	BUN	—	@	!
47 pharis	pharis	ALF	CO	ATE	TO5	KRO	3pt	ooo	BOB	BUN	—	@	!
COLOTIS													
54 vesta	amelia	SUD	NR	—	—	—	—	—	—	•	GAM	@	!
57 celimene	sudanicus	SUD	RA	—	—	—	—	—	—	•	gam		
58 ione		SUD	NR	—	—	—	—	—	—	•	GAM	@	!
60 danae	eupompe	SUD	NR	—	—	—	—	—	—	•	GAM		
61 aurora	evarne	SUD	NR	—	—	—	—	—	—	•	GAM	@	!
62 antevippe	antevippe	SUD	NR	ooo	tof	kro	—	—	ooo	•	GAM	@	!
63 euippe	euippe	UBQ	CO	ATE	TO5	KRO	3PT	ABU	BOB	•	GAM	@	!
65 evagore	antigone	SUD	CO	ooo	ooo	ooo	—	ooo	ooo	•	GAM	@	!
BELENOIS													
68 aurota		SUD	CO	ooo	ooo	kro	ooo	abu	bob	•	gam		!
69 creona	creona	SUD	VC	ate	tof	kro	3pt	ABU	bob	•	GAM	@	!
70 gidica	gidica	SUD	NR	ooo	—	—	—	—	—	—	gam		
72 subeida	frobeniusi	SUD	NR	—	—	—	—	—	—	—	GAM		!
73 calypso	calypso	ALF	VC	ATE	tof	KRO	3PT	ABU	BOB	•	gam	@	!
74 theora	theora	MEF	CO	ATE	TOF	KRO	3pt	ABU	BOB	•	—	@	!

LOCALITIES		subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
76	hedyle	hedyle	DRF	NR	ATE	tof	kro	3pt	ooo	bob	•	—			!
DIXEIA															
78	doxo	doxo	SUD	NR	—	—	—	—	—	—	—	GAM			
79	orbona	orbona	SUD	NR	—	—	—	—	—	—	—	gam			
80	cebron		DRF	NR	ooo	tof	KRO	3pt	abu	BOB	•	—	@		!
81	capricornus	capricornus	DRF	NR	ooo	tof	KRO	3pt	ooo	BOB	•	—	@		!
APPIAS															
84	sylvia	sylvia	ALF	CO	ATE	tof	KRO	3PT	ABU	BOB	•	ooo	@		!
85	phaola	phaola	WEF	NR	ATE	tof	ooo	3PT	—	ooo	•	—	@		!
86	sabina	sabina	MEF	CO	ATE	tof	KRO	3PT	ABU	BOB	•	—	@		!
87	epaphia	epaphia	UBQ	CO	ate	ooo	kro	3pt	ABU	bob	•	gam			!
LEPTOSIA															
88	alcesta	alcesta	ALF	vc	ATE	TO5	KRO	3PT	ABU	BOB	BUN	ooo	@		!
90	hybrida	hybrida	ALF	CO	ATE	TO5	KRO	3PT	abu	BOB	BUN	—	@		!
91	medusa		ALF	CO	ATE	TO5	KRO	3PT	ABU	BOB	BUN	—	@		!
92	marginea		MEF	NR	ATE	tof	kro	3pt	—	bob	•	—	@		!
93	wigginsi	pseudalcesta	ALF	NR	ate	tof	KRO	3pt	abu	bob	•	—	@		!
MYLOTHRIS															
95	chloris	chloris	UBQ	VC	ATE	TO5	KRO	3PT	ABU	BOB	BUN	GAM	@		!
100	dimidiata		WEF	NR	ATE	tof	—	ooo	—	ooo	•	—		ww	!
103	aburi		DRF	NR	—	—	—	—	ABU	—	—	gam			!
106	poppea		MEF	NR	ATE	TO5	kro	3PT	ABU	BOB	BUN	—	@	ww	!
107	spica		MEF	NR	ATE	tof	kro	3pt	ABU	ooo	•	—		en	!
109	rhodope		ALF	CO	ATE	tof	KRO	3pt	ABU	BOB	BUN	ooo	@		!
110	jaopura		ALF	CO	ATE	tof	kro	3pt	ABU	ooo	•	—			!
111	schumanni	schumanni	MEF	NR	ATE	tof	kro	3pt	ABU	ooo	•	—	@		!
112	atewa		WEF	NR	ATE	ooo	—	—	—	—	—	—		en	!
LYCAENIDAE															
MILETINAE															
EULIPHYRA															
114	hewitsoni		MEF	RA	ate	tof	kro	ooo	—	ooo	•	—			!
115	mirifica		MEF	RA	ate	tof	—	ooo	—	—	—	—			!
116	leucyania		WEF	RA	ate	tof	kro	ooo	—	ooo	•	—			

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
ASLAUGA														
117 ernesti		DRF	VR	—	—	—	—	—	—	—	—			
118 marginalis		MEF	NR	ate	tof	kro	3pt	ABU	bob	•	—			!
121 lamborni		WEF	RA	ATE	tof	kro	ooo	—	—	—	—			!
124 imitans		MEF	RA	—	—	—	—	—	—	—	—			!
MEGALOPALPUS														
127 zymna		ALF	CO	ATE	tof	kro	3PT	—	bob	•	—	@		!
129 metaleucus		MEF	NR	ATE	tof	kro	3pt	—	BOB	•	—	@		!
SPALGIS														
130 lemolea		DRF	NR	ATE	tof	kro	3pt	ABU	BOB	•	gam	@		!
LACHNOCNEMA	check													
131 vuattouxi		DRF	NR	ATE	tof	kro	3pt	abu	bob	•	gam	@		!
133 emperanus		DRF	NR	ate	tof	kro	3pt	abu	bob	•	GAM	@		!
135 disrupta		MEF	RA	???	tof	kro	ooo	—	ooo	•	—			
136 reutlingeri	reutlingeri	MEF	RA	ATE	tof	kro	ooo	—	—	—	—			
137 luna		WEF	RA	—	—	—	—	—	—	—	—			
139 albimacula		WEF	RA	???	tof	ooo	ooo	—	—	—	—			
LIPTENINAE														
PTELINA														
141 carnuta		MEF	NR	ATE	tof	kro	3PT	—	BOB	kro	—	@		!
PENTILA														
142 pauli	pauli	DRF	NR	ATE	tof	KRO	3pt	ABU	bob	•	—	@		!
144 petreoides		WEF	VR	ATE	tof	ooo	—	—	—	—	—		ww	
147 petreia		MEF	CO	ATE	tof	KRO	3PT	—	bob	•	—	@		!
152 picena		MEF	NR	ATE	tof	kro	3pt	—	bob	•	—	@		!
155 phidia		MEF	NR	ATE	tof	KRO	3pt	ooo	BOB	•	—	@	en	!
157 hewitsonii	hewitsonii	MEF	NR	ATE	tof	KRO	3pt	—	ooo	•	—			!
TELIPNA														
159 acraea	acraea	WEF	NR	ATE	TOF	kro	3pt	—	bob	•	—			!
160 semirufa		WEF	NR	ATE	tof	kro	3pt	—	ooo	•	—		ww	!
161 maesseni		WEF	NR	—	—	—	—	—	—	—	—		vo	!

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
ORNIPHOLIDOTOS														
170 nigeriae		WEF	RA	ATE	tof	kro	ooo	—	bob	•	—			!
171 onitshae		WEF	RA	ATE	tof	kro	ooo	—	ooo	•	—			!
172 irwini		WEF	RA	ATE	tof	kro	ooo	—	ooo	•	—			
173 issia		WEF	RA	ATE	tof	kro	ooo	—	ooo	•	—		ww	
174 tiassale		WEF	NR	ATE	tof	kro	ooo	—	bob	•	—		ww	!
175 nympha		WEF	RA	ATE	tof	kro	ooo	—	ooo	•	—			!
TORBENIA														
177 wojtusiaki		WEF	RA	ATE	tof	kro	ooo	—	ooo	•	—			!
MIMACRAEA														
179 neurata		WEF	RA	ATE	tof	kro	3pt	—	ooo	•	—			!
181 darwinia		WEF	NR	ATE	tof	kro	3pt	—	bob	•	—		ww	!
182 maesseni		WEF	NR	—	—	—	—	—	—		—		en	!
MIMERESIA														
184 libentina		ALF	CO	ATE	TOF	KRO	3PT	ABU	BOB	•	—	@		!
185 moyambina		WEF	VR	ATE	tof	kro	ooo	—	—	—	—		ww	
186 debora	catori	WEF	VR	ooo	tof	kro	ooo	—	—	—	—			
187 semirufa		WEF	RA	ATE	tof	KRO	3pt	—	ooo	•	—		en	!
190 cellularis		WEF	RA	ATE	tof	ooo	ooo	—	—	—	—			
191 issia		WEF	RA	ATE	TOF	ooo	3PT	—	—	—	—		en	!
PSEUDERESIA														
192 eleaza	eleaza	WEF	NR	ATE	tof	kro	3pt	—	ooo	•	—	@		!
ERESIOMERA														
193 bicolor		MEF	NR	ATE	TOF	KRO	3PT	ABU	BOB	•	—	@		!
194 isca	occidentalis	WEF	RA	ATE	tof	kro	3pt	ooo	bob	•	—			!
195 jacksoni		WEF	VR	ate		ooo	ooo	ooo	—	—	—		en	
197 petersi		WEF	RA	ATE	tof	kro	3pt	—	—	—	—		en	!
CITRINOPHILA														
199 marginalis		MEF	CO	ATE	tof	kro	3pt	ABU	bob	•	—	@		!
200 similis		MEF	CO	ATE	tof	KRO	3pt	ABU	BOB	BUN	—	@		!
202 erastus	erastus	WEF	NR	ATE	tof	KRO	3pt	—	bob	•	—			!
ERESINA	check													
204 maesseni		MEF	RA	ate	tof	KRO	3pt	abu	bob	•	—			!
206 pseudofusca		MEF	RA	ooo	tof	kro	3pt	ABU	bob	•	—			!

LOCALITIES		subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
210	saundersi		MEF	RA	ooo	tof	kro	3pt	ooo	ooo	•	—			
212	theodori		MEF	RA	ate	tof	kro	3pt	ABU	bob	•	—			!
ARGYROCHEILA															
213	undifera	undifera	WEF	RA	ATE	tof	kro	ooo	—	ooo	•	—			!
LIPTENA		check													
216	submacula		MEF	NR	ATE	tof	kro	3pt	ooo	BOB	•	—	@		!
217	griveaudi		WEF	VR	ATE	tof	kro	—	—	—	—	—		en	
218	simplicia		MEF	CO	ATE	tof	kro	3pt	ABU	BOB	•	—	@		!
222	tiassale		MEF	RA	ooo	tof	kro	—	ABU	—	—	—		en	!
224	albicans		WEF	RA	ATE	tof	kro	ooo	—	ooo	•	—			!
225	alluaudi		WEF	NR	ATE	TO5	KRO	3pt	—	BOB	•	—	@		!
226	fatima		???	VR	ooo		ooo	—	—	ooo	•	—			
227	pearmani		WEF	VR	—		—	—	—	—	—	—			!
229	ferrymani	bigoti	DRF	RA	—		ooo	—	—	—	—	ooo			
231	septistrigata		DRF	NR	ATE	TOF	kro	ooo	ABU	ooo	•	—			!
232	evanescens		WEF	RA	ate	tof	kro	ooo	—	ooo	•	—			
234	xanthostola	coomassiensis	WEF	RA	ATE	TOF	kro	3pt	—	ooo	•	—	@		!
236	rochei		DRF	RA	ATE	tof	kro	ooo	—	ooo	•	—	@		!
237	flavicans		MEF	RA	ATE	tof	kro	ooo	ooo	ooo	•	—			
239	seyboui		WEF	VR	ooo	TOF	kro	—	—	—	—	—		en	
240	similis		WEF	RA	ATE	tof	kro	ooo	—	ooo	•	—			!
242	helena		WEF	NR	ATE	tof	kro	3pt	—	bob	•	—		ww	!
243	catalina		WEF	NR	ATE	tof	kro	3pt	—	bob	•	—			!
KAKUMIA															
246	otlauga		WEF	NR	ATE	tof	kro	3pt	—	bob	•	—			!
FALCUNA															
249	leonensis		MEF	CO	ATE	tof	KRO	3pt	ooo	BOB	BUN	—	@	ww	!
252	campimus		WEF	NR	ATE	TOF	kro	3pt	—	bob	•	—			!
TETRARHANIS															
254	symplocus		MEF	CO	ATE	tof	KRO	3PT	ooo	BOB	•	—	@		!
255	baralingam		WEF	RA	ate	tof	kro	3PT	—	ooo	•	—	@	ww	!
260	stempfferi	stempfferi	WEF	VR	ATE	tof	ooo	ooo	—	ooo	•	—			

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
LARINOPODA														
264 aspidos		MEF	NR	—	—	—	—	—	—	—	—	@		!
265 eurema		MEF	CO	ATE	TO5	KRO	3PT	ooo	BOB	•	—	@	ww	!
MICROPENTILA														
266 adelgitha		MEF	CO	ATE	tof	KRO	3pt	—	bob	•	—			!
267 adelgunda		MEF	VR	ate	tof	kro	ooo	—	ooo	•	—			!
268 dorothea		MEF	NR	ATE	tof	kro	3PT	—	ooo	•	—			
270 brunnea	brunnea	WEF	RA	ATE	tof	kro	ooo	—	bob	•	—			!
275 mamfe		WEF	VR	ooo	tof	kro	ooo	ooo	—	—	—		en	!
IRIDANA	check													!
278 incredibilis		ALF	RA	ate	tof	kro	3pt	ABU	ooo	•	—			
279 ghanana		ALF	VR	—	???	???	—	—	—	—	—			
280 exquisuta		MEF	RA	ate	tof	kro	ooo	—	ooo	•	—			
281 nigeriana		ALF	RA	ate	tof	kro	ooo	ABU	ooo	•	—			!
282 hypocala		MEF	VR	ooo	—	—	—	—	—	—				
HEWITSONIA														
283 boisduvalii		WEF	NR	ATE	tof	kro	3pt	abu	bob	•	—			!
284 occidentalis		MEF	RA	ate	tof	kro	3pt	ABU	ooo	•	—			!
286 inexpectata		MEF	NR	ATE	tof	kro	3pt	ABU	ooo	•	—			!
CERAUTOLA														
289 crowleyi	crowleyi	MEF	NR	ate	tof	kro	3pt	ABU	ooo	•	—			!
291 ceraunia		MEF	NR	ate	tof	kro	3pt	ABU	ooo	•	—			!
EPITOLA														
294 posthumus		MEF	NR	ATE	tof	kro	3pt	ABU	bob	•	—			!
295 uranoides	occidentalis		RA	ate	tof	kro	3pt	ooo	BOB	•	—			!
296 urania		MEF	RA	ATE	tof	kro	3pt	ooo	ooo	•	—			!
CEPHETOLA	check													
297 cephena	cephena	MEF	NR	ate	tof	kro	3pt	abu	bob	•	—			!
299 pinodes	pinodes	MEF	RA	ate	tof	kro	ooo	ooo	ooo	•	—			
300 subcoerulea		MEF	RA	ooo	tof	kro	3pt	ABU	ooo	•	—			!
302 mercedes	ivoriensis	MEF	RA	ooo	tof	kro	ooo	—	—	—	—			
303 obscura		MEF	RA	ATE	tof	kro	3pt	ABU	ooo	•	—			!
305 sublustris		MEF	NR	ooo	tof	kro	3pt	ABU	bob	•	—			!
306 maesseni		MEF	RA	ooo	—	—	—	—	—	—	—		vo	

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
307 collinsi		MEF	VR	—	tof	kro	ooo	ABU	ooo	•	—		en	!
HYPOPHYTALA	check													
308 hyettoides		MEF	NR	ate	tof	kro	3pt	ABU	bob	•	—			!
310 hyettina		MEF	RA	ATE	tof	kro	ooo	ooo	ooo	•	—			
311 henleyi		MEF	RA	ate	tof	kro	ooo	—	—	—	—			
312 benitensis	benitensis	WEF	RA	ate	tof	kro	ooo	—	ooo	•	—			
PHYTALA														
314 elais	elais	WEF	RA	ATE	tof	kro	3pt	—	bob	•	—			!
GERITOLA														
315 gerina		WEF	RA	ooo	ooo	kro	ooo	ABU	ooo	•	—			!
320 virginea		WEF	RA	ate	tof	kro	3pt	ABU	ooo	•	—			!
STEMPFFERIA	check													
322 cercene		WEF	RA	ate	tof	kro	ooo	—	ooo	•	—			!
324 moyambina		WEF	NR	ATE	tof	kro	3pt	—	bob	•	—			!
326 dorothea		WEF	NR	ate	tof	kro	ooo	ooo	bob	•	—		ww	
330 leonina		MEF	NR	ate	tof	kro	3pt	abu	BOB	•	—	@	ww	!
334 ciconia	ciconia	WEF	NR	ATE	tof	kro	ooo	—	ooo	•	—			
335 zelza		WEF	RA	—	—	—	ooo	—	—	—	—			
340 michelae	michelae	ALF	NR	ATE	TOF	kro	3pt	abu	bob	•	—			!
342 kholifa		WEF	NR	ate	tof	kro	3pt	—	bob	•	—			
344 staudingeri		WEF	RA	ATE	tof	kro	ooo	ABU	ooo	•	—		ww	
AETHIOPANA	check													
346 honorius	divisa	WEF	NR	ATE	tof	kro	3pt	abu	bob	•	—			!
EPITOLINA	check													
347 dispar		MEF	CO	ATE	tof	kro	3PT	abu	BOB	•	—	@		!
348 melissa		MEF	CO	ATE	tof	kro	3pt	ooo	bob	•	—			!
350 catori	catori	WEF	NR	ATE	tof	kro	3pt	ABU	bob	•	—	@		!
NEAVEIA														
352 lamborni	lamborni	MEF	RA	ate	tof	kro	ooo	ABU	ooo	•	—			!
THECLINAE														
MYRINA														
354 silenus	silenus	GUI	NR	ooo	ooo	kro	ooo	abu	bob	•	gam			!
355 subornata	subornata	GUI	RA	—	—	ooo	—	—	—	—	gam			

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
OXYLIDES														
356 faunus	faunus	MEF	CO	ATE	tof	KRO	3PT	ABU	BOB	•	—	@		!
DAPIDODIGMA														
359 hymen		MEF	NR	ate	TOF	KRO	3PT	abu	bob	•	gam			!
360 demeter	demeter	MEF	RA	ATE	tof	kro	3pt	ooo	bob	•	—			!
APHNAEUS														
361 orcas		MEF	NR	ate	tof	kro	3pt	abu	bob	•	—			!
362 argyrocyclus		MEF	RA	ooo	tof	kro	ooo	—	ooo	•	—			!
363 asterius			RA	ATE	tof	kro	3pt	ABU	ooo	•	—			!
364 brahami		GUI	RA	—	—	—	—	—	—	—	gam			
365 jefferyi			VR	ooo	ooo	kro	ooo	—	—	—	—			
366 charboneli			VR	ooo	TOF	kro	—	—	—	—	—			
367 gilloni		MEF	VR	ooo	ooo	ooo	—	—	—	—	—			
APHARITIS														
368 nilus		SUD	RA	—	—	—	—	—	—	—	GAM			
SPINDASIS														
369 mozambica		GUI	NR	ate	tof	kro	3pt	abu	bob	•	gam	@		!
370 avriko		GUI	RA	—	—	ooo	—	—	—	—	gam			
371 crustaria			RA	—	—	—	—	—	—	—	—			
372 iza			RA	ATE	TOF	kro	3pt	ABU	bob	•	—		ww	!
373 menelas			VR	ate	tof	kro	ooo	—	ooo	•	—			
ZERITIS														
374 neriene		SUD	NR	ooo	ooo	kro	ooo	ooo	ooo	•	gam			
AXIOCERSES														
375 harpax		GUI	NR	ATE	tof	kro	3PT	ABU	bob	•	gam	@		!
377 amanga		SUD	RA	—	—	—	—	—	—	—	gam	@		!
LIPAPHNAEUS														
378 leonina	leonina	MEF	NR	ATE	tof	kro	3pt	—	ooo	•	—			!
379 aderna	aderna	GUI	NR	ooo	tof	kro	ooo	abu	ooo	•	ooo			!
PSEUDALETIS														
380 agrippina		MEF	VR	ooo	ooo	kro	ooo	—	ooo	•	—			
386 subangulata			VR	—	—	ooo	ooo	—	—	—	—		en	
390 dardanella		MEF	VR	ooo	ooo	ooo	ooo	—	—	—	—			
391 leonis		MEF	RA	ate	—	kro	3pt	ooo	bob	•	—			!

LOCALITIES		subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
IOLAUS															
Subgenus Iolaus		Iolaus													
392	eurisus		ALF	NR	ATE	—	kro	3pt	ABU	bob	BUN	ooo	@		!
Subgenus Iolaphilus		Iolaphilus													
393	menas	menas	SUD	NR	—	—	—	—	—	—	—	GAM			!
395	carolinae		MEF	VR	ate	ooo	kro	ooo	ooo	ooo	•	—		en	!
397	iulus		MEF	NR	ATE	tof	kro	3pt	ABU	bob	•	—	@		!
Subgenus Philiolaus		Argiolaus													
398	ismenias		SUD	NR	ooo	—	ooo	—	abu	—	—	GAM	@		!
400	alcibiades		MEF	RA	ate	tof	kro	3pt	ABU	bob	•	—			!
401	parasilanus	maesseni	MEF	RA	—	—	—	—	—	ooo	•	—			!
402	paneperata		MEF	NR	ATE	TOF	kro	3pt	—	ooo	•	—			!
403	lukabas		MEF	RA	ate	tof	kro	ooo	—	ooo	•	—			
404	mane		MEF	RA	ATE	tof	kro	ooo	—	bob	•	—		ww	
405	theodori		MEF	VR	—	—	—	—	—	—	—	—		vo	
406	likpe		MEF	VR	—	—	—	—	—	—	—	—		vo	
407	calisto		MEF	NR	ate	tof	kro	3pt	ABU	bob	•	—			!
408	laonides		WEF	RA	ooo	ooo	kro	ooo	—	ooo	•	—			
Subgenus Tanuetheira		Tanuetheira													
410	timon	timon	MEF	RA	ATE	tof	kro	3pt	—	bob	•	—			
Subgenus Epamera		Epamera													
411	alienus	bicaudatus	SUD	RA	—	—	—	—	—	—	—	gam			
414	scintillans		SUD	NR	—	—	—	—	—	—	—	gam			
415	laon	laon	MEF	NR	ooo	tof	kro	ooo	abu	bob	•	—			!
418	banco		WEF	RA	—	ooo	ooo	3PT	—	—	—	—		en	
426	sappirus		WEF	RA	ooo	ooo	kro	3pt	—	bob	•	—			!
428	bellina	bellina	MEF	NR	ate	tof	kro	3pt	abu	bob	•	—			!
432	fontainei		WEF	RA	—	—	—	—	—	—	—	—			
434	aethria		MEF	RA	ATE	tof	kro	3pt	ooo	bob	•	—			!
435	farquharsoni		MEF	RA	ate	tof	kro	3pt	—	ooo	•	—			
436	iasis	iasis	ALF	NR	ate	tof	kro	3pt	ABU	bob	•	gam			!
437	maesa		MEF	RA	ate	tof	ooo	3pt	ABU	ooo	•	—			

LOCALITIES		subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
ETESIOLAUS															
439	catori	catori	ALF	RA	ate	tof	kro	3pt	—	bob	•	—			!
440	kyabobo		DRF	RA	ooo	ooo	kro	3pt	—	ooo	•	—			!
STUGETA															
441	marmoreus	marmoreus	SUD	NR	—	—	ooo	—	—	—	—	gam			
HYPOLYCAENA															
443	philippus	philippus	GUI	CO	ATE	tof	kro	3pt	ABU	bob	•	GAM	@		!
444	kadiskos		MEF	RA	ATE	tof	ooo	ooo	—	ooo	•	—			
445	liara	liara	MEF	RA	ATE	tof	kro	3pt	abu	ooo	•	—			
446	lebona	lebona	WEF	NR	ATE	tof	kro	3PT	abu	bob	•	—	@		!
447	clenchi		WEF	RA	ATE	TO5	kro	3pt	ooo	bob	•	—	@	ww	!
449	scintillans		ALF	CO	ATE	tof	KRO	3PT	ABU	bob	•	—	@		!
450	dubia		ALF	CO	ATE	tof	KRO	3PT	ABU	bob	•	—	@		!
451	kakumi		MEF	CO	ATE	tof	kro	3PT	ooo	bob	•	—	@		!
452	antifaunus	antifaunus	MEF	NR	ATE	tof	kro	3pt	ABU	bob	•	—			!
453	hatita	hatita	MEF	CO	ATE	tof	kro	3pt	ABU	BOB	•	—	@		!
455	nigra		WEF	CO	ATE	TOF	kro	3pt	ABU	bob	•	—			!
PILODEUDORIX															
457	camerona	camerona	MEF	NR	ate	tof	kro	3PT	ABU	bob	•	—			!
458	diyllus	diyllus	MEF	NR	ATE	tof	kro	3pt	abu	bob	•	—			!
460	caerulea	caerulea	GUI	NR	ate	tof	kro	3pt	ABU	bob	•	gam			!
461	zela		WEF	RA	ATE	tof	kro	3pt	abu	ooo	•	—			!
462	catori		DRF	RA	ooo	tof	kro	3pt	abu	ooo	•	—			!
467	otraeda		MEF	NR	ATE	tof	kro	3PT	—	bob	•	—			!
468	leonina	leonina	MEF	NR	ATE	tof	kro	3PT	—	bob	•	—			!
469	virgata		MEF	RA	ATE	tof	kro	3PT	—	ooo	•	—			!
473	deritas		MEF	RA	ate	tof	ooo	ooo	—	ooo	•	—			
474	aucta		MEF	RA	—	—	—	—	—	—	—	—			
475	pseudoderitas		MEF	RA	ate	TOF	kro	3pt	ooo	bob	•	—			
476	laticlavia		MEF	RA	ATE	tof	kro	ooo	—	ooo	•	—			
477	aurivilliusi		WEF	RA	ATE	tof	kro	3pt	ABU	ooo	•	—		ww	!
478	kiellandi		WEF	RA	ATE	tof	kro	ooo	—	ooo	•	—			!
479	corruscans	kakumi	WEF	VR	ooo	tof	kro	ooo	—	—	—	—			
480	violetta		WEF	RA	ATE	TOF	kro	3pt	ooo	bob	•	—			!

LOCALITIES		subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
481	fumata		WEF	VR	ooo	ooo	ooo	—	—	—	—	—			
PARADEUDORIX															
484	eleala	viridis	ALF	NR	ATE	tof	KRO	3pt	ABU	bob	•	—	@		!
487	moyambina		WEF	VR	ATE	tof	kro	ooo	—	—	—	—			!
HYPOMYRINA															
491	mimetica		MEF	RA	ate	tof	kro	3pt	—	ooo	•	—			
492	nomion	nomion	DRF	NR	ate	tof	kro	3pt	ABU	bob	•	GAM	@		!
DEUDORIX															
494	antalus		GUI	CO	ATE	tof	kro	3pt	ABU	bob	•	GAM			!
495	livia		SUD	VR	—	—	—	—	—	—	—	—			
496	lorisona	lorisona	ALF	NR	ATE	TOF	kro	3PT	ABU	BOB	•	—	@		!
497	kayonza	ssp	WEF	RA	ATE	tof	kro	3pt	—	ooo	•	—			!
498	dinochares		GUI	RA	ooo	tof	kro	—	ooo	ooo	•	GAM			!
499	dinomenes	diomedes	DRF	RA	ate	tof	kro	3pt	—	ooo	•	—			!
500	odana	odana	ALF	NR	ATE	tof	kro	3pt	ooo	bob	•	—			!
501	galathea		ALF	NR	ATE	tof	kro	3pt	ABU	bob	•	—			!
502	caliginosa		MEF	RA	ATE	TOF	kro	3pt	—	ooo	•	—			!
CAPYS															
506	vorgasi		SPE	VR	—	—	—	—	—	—	—	—		vo	
POLYOMMATINAE															
ANTHENE															
507	rubricinctus		MEF	CO	ATE	TOF	KRO	3PT	ooo	bob	BUN	—	@		!
508	ligures		MEF	RA	ate	tof	kro	ooo	—	ooo	•	—			!
510	sylvanus	sylvanus	ALF	CO	ATE	TO5	kro	3PT	abu	BOB	•	—	@		!
512	liodes	liodes	ALF	NR	ATE	tof	kro	3pt	abu	bob	•	ooo	@		!
513	definita		GUI	NR	ATE	tof	kro	3pt	ooo	ooo	•	ooo			!
514	princeps	princeps	GUI	NR	ATE	tof	kro	ooo	ABU	ooo	•	gam			!
515	starki		GUI	RA	—	—	—	ooo	ooo	—	—	gam	@		!
516	amarah		SUD	NR	ooo	ooo	kro	ooo	—	—	—	GAM	@		!
517	lunulata		GUI	CO	ATE	tof	kro	3pt	abu	bob	•	GAM	@		!
518	kikuyu		GUI	RA	ooo	—	—	—	ooo	—	—	gam			!
519	talboti		SUD	VR	—	—	—	—	—	—	—	gam			!
520	wilsoni		GUI	RA	—	—	—	—	—	—	—	ooo			

LOCALITIES		subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
521	levis		ALF	NR	ate	tof	kro	3pt	ABU	bob	•	—			!
522	irumu		ALF	NR	ate	tof	kro	3pt	ABU	ooo	•	ooo			!
523	larydas		ALF	CO	ATE	TOF	KRO	3PT	ABU	BOB	•	ooo	@		!
524	crawshayi	crawshayi	GUI	NR	ATE	tof	kro	ooo	ooo	ooo	•	GAM	@		!
525	lachares	lachares	MEF	NR	ATE	tof	kro	3PT	—	bob	•	—			!
527	lysicles		WEF	NR	ATE	TOF	kro	3pt	—	bob	•	—			!
530	atewa		WEF	RA	ATE	tof	ooo	3PT	—	ooo	•	—		en	!
532	radiata		WEF	VR	ATE	tof	ooo	ooo	—	—	—	—		ww	
534	locuples		WEF	RA	ate	tof	kro	3pt	—	ooo	•	—			!
537	scintillula	aurea	WEF	RA	ATE	tof	kro	ooo	—	—	—	—			
538	helpsi		WEF	VR	ATE	ooo	—	—	—	—	—	—		en	!
539	juba		WEF	NR	ATE	tof	kro	3pt	—	ooo	•	—			!
NEURYPEXINA															
540	lyzanius		MEF	CO	ATE	tof	kro	3PT	—	bob	•	—	@		!
NEURELLIPES															
542	lusones	fulvimacula	WEF	RA	ATE	tof	kro	3pt	—	ooo	•	—			!
543	chryseostictus		WEF	NR	ATE	TOF	kro	3pt	—	bob	•	—			!
544	fulvus		WEF	VR	ATE	tof	ooo	ooo	—	—	—	—			!
545	staudingeri		WEF	VR	ate	ooo	ooo	ooo	—	—	—	—			
546	gemmifera		DRF	RA	ooo	—	ooo	ooo	—	ooo	•	—			!
TRICLEMA															
547	rufoplagata		MEF	RA	ooo	ooo	ooo	ooo	—	—	•	—			
548	lucretilis	lucretilis	MEF	NR	ATE	tof	kro	3pt	—	bob	•	—	@		!
549	lamias	lamias	ALF	NR	ate	tof	kro	3pt	abu	bob	•	—			!
550	fasciatus		WEF	NR	ate	tof	KRO	3pt	—	bob	•	—			!
551	obscura		WEF	RA	ate	tof	kro	ooo	—	—	—	—			
552	inconspicua		WEF	RA	ate	tof	kro	ooo	—	ooo	•	—			!
554	hades		MEF	NR	ATE	tof	kro	3pt	abu	bob	•	gam			!
555	phoenicis		DRF	RA	ooo	tof	kro	ooo	ooo	—	—	ooo			!
556	nigeriae		GUI	NR	ATE	tof	kro	ooo	abu	bob	•	gam	@		!
CUPIDESTHES															
560	jacksoni		WEF	NR	ATE	tof	kro	3pt	—	ooo	•	—		en	!
561	mimetica		DRF	RA	ooo	ooo	ooo	ooo	—	—	—	—			
562	lithas		MEF	NR	ATE	TO5	KRO	3pt	ABU	BOB	•	—	@		!

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
564 leonina		MEF	NR	ATE	tof	kro	3pt	—	ooo	•	—			!
564 pungusei		WEF	VR	ooo	ooo	ooo	ooo	—	—	—	—		en	!
PSEUDONACADUBA														
565 sichela	sichela	GUI	CO	ATE	tof	KRO	3pt	—	bob	•	GAM	@		!
LAMPIDES														
567 boeticus		UBQ	NR	ate	TOF	kro	3pt	abu	bob	•	GAM	@		!
URANOTHAUMA														
568 falkensteini		ALF	CO	ATE	TO5	KRO	3pt	abu	BOB	•	—	@		!
PHLYARIA														
574 cyara	stactalla	ALF	CO	ATE	TO5	kro	3pt	—	bob	•	—	@		!
CACYREUS														
575 lingeus		UBQ	CO	ATE	TO5	kro	3PT	ABU	BOB	•	gam	@		!
577 audeoudi		WEF	RA	ate	tof	KRO	3pt	—	bob	•	—			
LEPTOTES														
578 pirithous		UBQ	CO	ATE	TOF	KRO	3PT	ABU	BOB	•	GAM	@		!
579 babaulti		GUI	NR	ate	tof	kro	3pt	abu	bob	•	gam			!
580 jeanneli		UBQ	CO	ate	tof	kro	3pt	abu	ooo	•	GAM	@		!
581 brevidentatus		GUI	NR	ate	tof	kro	3pt	abu	ooo	•	gam			!
582 pulchra		SPE	RA	ooo	ooo	ooo		—	ooo	•	ooo			
TUXENTIUS														
583 cretosus	nodieri	SUD	CO	—			—	—	—	—	GAM	@		!
584 carana	carana	ALF	CO	ATE	TO5	KRO	3pt	abu	BOB	•	—	@		!
TARUCUS	check													
586 ungemachi		SUD	NR	—	—	—	—	—	—	—	GAM	@		!
588 rosacea		SUD	RA	—	—	—	—	—	—	—	ooo			
ACTIZERA														
592 lucida		GUI	EA	—	—	ooo	ooo	—	ooo	•	ooo			
EICOCHRYSOPS														
593 hippocrates		SPE	CO	ATE	tof	KRO	3PT	ABU	bob	•	gam	@		!
594 dudgeoni		GUI	NR	—	—	—	—	—	—		gam			!
CUPIDOPSIS														
595 jobates	mauritanica	SUD	RA	—	—	kro	ooo	ooo	ooo	•	gam			
596 cissus	cissus	GUI	NR	ATE	tof	kro	ooo	ooo	ooo	•	gam	@		!

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
EUCHRYSOPS														
598 albistriata	greenwoodi	GUI	NR	ooo	ooo	kro	ooo	abu	ooo	•	GAM	@		!
600 reducta		SUD	NR	—	—	—	—	—	—	—	GAM	@		!
601 malathana		UBQ	CO	ATE	tof	KRO	3pt	abu	BOB	•	gam	@		!
604 osiris		GUI	CO	ATE	tof	kro	ooo	abu	bob	•	gam			!
605 barkeri		GUI	NR	ooo	ooo	kro	ooo	—	bob	•	GAM			!
606 sahelianus		SUD	NR	—	—	—	—	—	—	—	gam	@		!
LEPIDOCHRYSOPS														
607 victoriae	occidentalis	GUI	RA	—	—	—	—	—	—	—	GAM			!
608 parsimon		GUI	RA	—	—	kro	ooo	ooo	bob	•	gam			!
611 synchrematiza		GUI	RA	—	—	kro	ooo	—	ooo	•	ooo		ww	
615 quassi		GUI	NR	ooo	ooo	kro	ooo	—	ooo	•	—			!
THERMONIPHAS														
617 micylus	micylus	MEF	CO	ATE	tof	kro	3PT	ABU	bob	BUN	—	@		!
OBORONIA														
622 punctatus		MEF	CO	ATE	tof	KRO	3pt	ooo	bob	•	—	@		!
623 liberiana		WEF	NR	—	ooo	KRO	ooo	—	—	—	—		ww	!
624 pseudopunctatus		MEF	NR	—	—	—	—	—	—	—	—	@		!
625 guessfeldti		DRF	NR	ATE	tof	KRO	3pt	ooo	BOB	•	—	@		!
626 ornata	ornata	ALF	CO	ATE	TOF	KRO	3pt	ooo	BOB	BUN	—	@		!
AZANUS	check													
627 ubaldus		SUD	RA	—	—	—	—	—	—	—	gam			
628 jesous		SUD	RA	—	—	ooo	—	ooo	—	—	GAM	@		!
629 moriqua		SUD	NR	—	—	kro	ooo	ooo	—	—	GAM			!
630 mirza		UBQ	CO	ATE	TO5	KRO	3pt	ABU	BOB	BUN	gam	@		!
631 natalensis		GUI	RA	—	—		ooo	ooo	ooo	•	gam	@		!
632 isis		ALF	CO	ATE	tof	kro	3pt	abu	bob	•	ooo	@		!
CHILADES														
633 eleusis		SUD	RA	—	—	—	—	—	—	—	gam			
634 trochylus		GUI	NR	ooo	tof	kro	3pt	abu	—	—	GAM	@		!
ZIZEERIA														
635 knysna		UBQ	CO	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM	@		!
ZIZINA														
636 antanossa		GUI	NR	ate	tof	kro	3pt	abu	bob	•	gam	@		!

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM		
ZIZULA													
637 hylax		UBQ	CO	ate	tof	kro	3pt	ABU	BOB	BUN	GAM	@	!
RIODINIDAE													
ABISARA													
638 intermedia		WEF	VR	ate	tof	ooo	ooo	—	—	—	—		
639 tantalus	tantalus	WEF	VR	ate	tof	ooo	ooo	—	—	—	—		
642 gerontes	gerontes	WEF	RA	ATE	tof	kro	ooo	—	—	—	—		
NYMPHALIDAE													
LIBYTHEINAE													
LIBYTHEA													
646 labdaca	labdaca	ALF	CO	ATE	TOF	KRO	3pt	ABU	BOB	•	—	@	!
DANAINAE													
DANAUS													
647 chrysippus	chrysippus	UBQ	VC	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM	@	!
TIRUMALA													
648 petiverana		GUI	CO	ATE	tof	kro	3pt	ABU	BOB	•	gam	@	!
AMAURIS													
650 niavius	niavius	GUI	CO	ATE	TO5	kro	3PT	ABU	BOB	•	ooo	@	!
651 tartarea	tartarea	ALF	NR	ATE	tof	kro	3PT	ABU	BOB	•	—	@	!
652 hecate	hecate		NR	ATE	tof	kro	3pt	ABU	BOB	•	—	@	!
653 damocles		DRF	CO	ATE	TOF	kro	3PT	ABU	bob	BUN	gam	@	!
SATYRINAE													
GNOPHODES													
656 betsimena	parmeno	ALF	CO	ATE	TO5	KRO	3pt	ABU	BOB	•	ooo	@	!
657 chelys			CO	ATE	TOK	KRO	3pt	ABU	BOB	•	ooo	@	!
MELANITIS													
658 leda		UBQ	CO	ATE	tof	kro	3PT	ABU	BOB	BUN	GAM	@	!
659 libya		UBQ	NR	ate	tof	kro	3PT		BOB	•	GAM	@	!
ELYMNIOPSIS													
661 bammakoo	bammakoo		CO	ATE	tof	kro	3pt	ABU	BOB	•	—	@	!

LOCALITIES		subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
BICYCLUS															
663	xeneas	occidentalis	ALF	NR	ATE	TOK	kro	3pt	ooo	BOB	•	—	@		!
665	evadne	evadne	WEF	NR	ATE	tof	kro	3PT	—	ooo	•	—	@		!
669	ephorus	ephorus	WEF	RA	ATE	TOK	kro	ooo	—	ooo	•	—			!
672	italus		WEF	NR	—	—	—	—	—	—	—	—	@		!
673	zinebi		ALF	NR	ATE	TOK	KRO	3pt	abu	BOB	•	—		ww	!
674	uniformis		WEF	RA	ATE	tof	kro	3pt	—	ooo	•	—			!
678	procora		WEF	NR	ATE	TOK	KRO	3PT	—	BOB	•	—			!
679	pavonis		GUI	CO	—	—	—	—	—	—	—	gam	@		!
680	milyas		GUI	NR	—	—	kro	—	—	—	—	gam			
681	trilophus	jacksoni	WEF	RA	ATE	tof	ooo	ooo	—	ooo	•	—			!
682	ignobilis	ignobilis	ALF	RA	ATE	tof	kro	—	—	ooo	•	—			!
683	maesseni		ALF	NR	ATE	tof	ooo	3pt	—	ooo	•	—	@	ww	!
684	nobilis		WEF	RA	ATE	tof	KRO	3pt	—	ooo	•	—			!
687	taenias		MEF	CO	ATE	TO5	KRO	3PT	ABU	bob	•	—	@		!
690	vulgaris		ALF	VC	ATE	TO5	KRO	3PT	ABU	BOB	BUN	gam	@		!
691	dorothea	dorothea	ALF	VC	ATE	TO5	KRO	3PT	ABU	BOB	BUN	—	@		!
692	sandace		ALF	VC	ATE	tof	KRO	3PT	ABU	BOB	BUN	—	@		!
693	sambulos	unicolor	WEF	NR	ATE	tof	KRO	3pt	—	bob	•	—			!
694	sangmelinae		WEF	NR	ATE	TO5	kro	3pt	—	BOB	•	—	@		!
695	mandanes		DRF	NR	ATE	tof	kro	ooo	ooo	ooo	•	—			!
696	auricruda	auricruda	MEF	RA	ate	ooo	kro	3pt	ooo	ooo	•	—			!
697	campa		GUI	NR	—	—	—	—	—	—	—	gam	@		!
698	angulosa	angulosa	GUI	CO	—	—	—	—	—	—	—	GAM	@		!
699	sylvicolus		WEF	NR	—	—	—	—	—	—	—	—			!
700	abnormis		WEF	NR	ATE	tof	KRO	3pt	—	BOB	•	—	@	ww	!
701	safitza	safitza	GUI	NR	ate	TO5	kro	3pt	abu	BOB	BUN	GAM	@		!
702	funebris		DRF	CO	ATE	tof	kro	3PT	ABU	BOB	•	gam	@		!
704	dekeyseri		WEF	RA	ATE	tof	ooo	ooo	—	—	—	—		ww	
705	istaris		WEF	NR	ATE	tof	kro	ooo	ABU	ooo	•	—			!
707	madetes	madetes	MEF	NR	ATE	TO5	kro	3PT	ABU	BOB	BUN	—	@		!
709	martius	martius	MEF	CO	ATE	TO5	kro	3PT	ABU	BOB	•	—	@		!
HALLELESIS															
712	halyma		WEF	NR	ATE	tof	kro	3PT	—	BOB	•	—	@	ww	!

LOCALITIES		subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
HENOTESIA															
713	*e*lisi		DRF	RA	—	—	—	—	—	—		ooo		ww	!
HETEROPSIS															
714	peitho		WEF	RA	ATE	tof	KRO	ooo	ABU	—	—	—			!
YPTHIMA															
715	asterope	asterope	SUD	RA	—	—	—	—	—	—	—	GAM			!
716	condamini	nigeriae	GUI	CO	—	—	ooo	—	—	—	—	GAM	@		!
717	antennata	cornesi	ALF	NR	—	—	—	—	—	—	—	dam	@		
718	vuattouxi		DRF	NR	ate	tof	ooo	—	abu	ooo	•	ooo	@	en	!
719	doleta		ALF	VC	ATE	TO5	KRO	3PT	ABU	BOB	BUN	—	@		!
721	pupillaris	pupillaris	GUI	NR	—	—	ooo	—	—	—	•	gam	@		!
722	impura	impura	GUI	RA	—	—	ooo	—	—	—	•	gam			!
YPTHIMOMORPHA															
724	itonia		SPE	NR		TOF	kro	3PT	—	bob	•	gam	@		!
CHARAXINAE															
CHARAXES															
725	varanes	vologeses	GUI	CO	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM	@		!
726	fulvescens	senegala	ALF	NR	ATE	tof	kro	3pt	ABU	BOB	•	—	@		!
728	candiope	candiope	GUI	RA	ATE	tof	kro	ooo	abu	ooo	•	ooo			
729	protoclea	protoclea	ALF	CO	ATE	TO5	KRO	3pt	abu	BOB	•	—	@		!
730	boueti		DRF	NR	ATE	tof	kro	3PT	ABU	BOB	•	—	@		!
731	cynthia	cynthia	ALF	CO	ATE	TOF	KRO	3PT	ABU	BOB	•	—	@		!
732	lucretius	lucretius	ALF	CO	ATE	tof	kro	3pt	ABU	BOB	•	—	@		!
733	lactetinctus	lactetinctus	GUI	RA	—	ooo	ooo	—	—	—	—	gam			!
734	epijasius		GUI	CO	ATE	tof	kro	—	—	—	—	GAM	@		!
736	castor	castor	DRF	NR	ATE	TOF	kro	3pt	abu	BOB	•	—	@		!
737	brutus	brutus	MEF	CO	ATE	tof	kro	3pt	ABU	BOB	•	gam	@		!
738	pollux	pollux	MEF	RA	ATE	tof	ooo	ooo	—	—	—	—			!
740	eudoxus	eudoxus	ALF	VR	ooo	—	ooo	ooo	—	—	—	—			!
741	tiridates	tiridates	ALF	CO	ATE	TOF	KRO	3pt	ABU	BOB	•	gam	@		!
742	bipunctatus	bipunctatus	WEF	NR	ATE	TOF	kro	3pt	—	BOB	•	—	@		!
743	numenes	numenes	ALF	NR	ATE	TOK	kro	3pt	ABU	BOB	•	—	@		!
744	smaragdalis	butleri	ALF	NR	ATE	tof	kro	3pt	—	bob	•	—			!

LOCALITIES		subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
745	imperialis	imperialis	ALF	RA	ATE	tof	kro	ooo	—	ooo	•	—			
746	ameliae	doumeti	ALF	NR	ATE	tof	kro	ooo	—	bob	•	—			!
747	pythodoris	davidi	DRF	VR	ooo	tof	kro	—	—	—	—	—			
748	hadrianus	hadrianus	WEF	RA	—	tof	kro	3PT	—	—	—	—	@		!
750	nobilis	claudei	WEF	VR	ATE	tof	kro	ooo	—	—	—	—			
752	fournierae	jolybouyeri	WEF	VR	ATE	—	—	ooo	—	—	—	—			
753	zingha		MEF	NR	ATE	TOF	kro	3pt	ABU	BOB	•	—	@		!
754	etesipe	etesipe	DRF	NR	ATE	tof	kro	3pt	ooo	BOB	•	—	@		!
755	achaemenes	atlantica	GUI	CO	ATE	tof	ooo	—	ABU	—	—	GAM	@		!
756	eupale	eupale	ALF	VC	ATE	TO5	KRO	3pt	ABU	BOB	•	—	@		!
757	subornatus	couilloudi	WEF	RA	ATE	tof	kro	3pt	—	BOB	•	—	@		!
758	anticlea	anticlea	ALF	NR	ATE	tof	kro	3pt	ooo	BOB	•	—	@		!
759	hildebrandti	gillesi	MEF	RA	ATE	TOF	KRO	3pt	—	BOB	•	—			!
760	etheocles	etheocles	ALF	CO	ATE	TOK	KRO	3pt	ABU	BOB	•	—	@		!
762	petersi		MEF	VR	ATE	TOF	kro	3pt	—	ooo	•	—		ww	
765	bocqueti	bocqueti	WEF	VR	ATE	tof	kro	ooo	—	ooo	•	—			
767	virilis	virilis	MEF	NR	ATE	tof	kro	3pt	ooo	BOB	•	—	@		!
768	cedreatis		MEF	NR	ATE	tof	kro	3pt	ABU	BOB	•	—	@		!
769	plantroui		DRF	RA	ATE	ooo	ooo	—	—	—	—	gam		ww	!
770	viola	viola	SUD	CO	—	—	ooo	—	—	—	—	GAM	@		
771	northcotti		GUI	RA	—	—	ooo	—	—	—	—	gam			!
772	pleione	pleione	ALF	CO	ATE	TOK	KRO	3pt	ABU	BOB	•	—	@		!
773	paphianus	falcata	WEF	NR	ATE	tof	kro	3pt	—	BOB	•	—	@		!
774	nichetes	bouchei	DRF	RA	ATE	tof	kro	ooo	—	bob	•	ooo			
775	porthos	gallayi	MEF	RA	ATE	tof	kro	3pt	—	bob	•	—			!
776	zelica	zelica	WEF	RA	ATE	TOF	kro	3pt	—	BOB	•	—	@		!
777	lycurgus	lycurgus	ALF	CO	ATE	TOF	kro	3pt		BOB	•	—	@		!
778	mycerina	mycerina	WEF	RA	ATE	TOF	ooo	3pt	—	BOB	•	—	@		
779	doubledayi		WEF	RA	ATE	tof	ooo	3pt	—	BOB	•	—	@		!
EUXANTHE															
780	eurinome	eurinome	MEF	NR	ATE	tof	kro	3pt	ABU	BOB	•	—	@		!

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM		
PALLA													
783 violinitens	violinitens	MEF	NR	ATE	tof	KRO	3pt	ooo	BOB	•	—		!
784 decius		MEF	NR	ATE	TOK	KRO	3pt	ABU	BOB	•	—		!
785 ussheri	ussheri	ALF	CO	ATE	TOF	KRO	3pt	abu	BOB	•	—	@	!
786 publius	publius	MEF	NR	ATE	tof	KRO	3pt	ooo	BOB	•	—		!
APATURINAE													
APATUROPSIS													
786a cleochares	cleochares	MEF	RA	ATE	—	kro	3pt	—	ooo	•	—		!
NYMPHALINAE													
KALLIMOIDES													
787 rumia	rumia	ALF	CO	ATE	TO5	KRO	3pt	ooo	BOB	•	—	@	!
VANESSULA													
788 milca	milca	WEF	RA	ATE	tof	—	—	—	—	•	—		
ANTANARTIA													
789 delius	delius	MEF	CO	ATE	TOF	KRO	3pt	—	BOB	•	—	@	!
VANESSA													
791 cardui	cardui	UBQ	NR	ate	tof	kro	3PT	abu	bob	•	GAM	@	!
PRECIS													
792 octavia	octavia	GUI	NR	ate	tof	kro	3pt	ABU	bob	•	GAM	@	!
793 antilope		GUI	NR	ate	tof	kro	ooo	abu	bob	•	GAM	@	!
796 ceryne	ceruana	SPE	NR	ooo	tof	kro	ooo	—	ooo	•	GAM		!
797 pelarga		ALF	NR	ATE	tof	kro	3pt	ABU	bob	•	ooo	@	!
798 sinuata		WEF	RA	ATE	tof	kro	ooo	—	ooo	•	—		!
HYPOLIMNAS													
801 misippus		UBQ	CO	ATE	tof	KRO	3PT	ABU	BOB	BUN	GAM	@	!
802 anthedon	anthedon	ALF	CO	ATE	TO5	KRO	3PT	ABU	BOB	•	—	@	!
803 dinarcha	dinarcha	WEF	NR	ATE	tof	kro	3pt	—	bob	•	—		!
806 salmacis	salmacis	MEF	CO	ATE	TO5	KRO	3PT	ABU	BOB	BUN	—	@	!
SALAMIS													
808 cacta	cacta	MEF	CO	ATE	tof	KRO	3pt	ABU	BOB	•	—	@	!

LOCALITIES		subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
PROTOGONIOMORPHA															
809	cytora		MEF	NR	ATE	TO5	KRO	3pt	abu	BOB	•	—	@	ww	!
811	parhassus		MEF	CO	ATE	TO5	KRO	3PT		BOB	•	—	@		!
812	anacardii	anacardii	DRF	NR	ooo	ooo	kro	ooo	ABU	ooo	•	gam	@		!
JUNONIA															
813	orithya	madagascariensis	SUD	CO	ooo	ooo	kro	ooo	—	ooo	•	GAM	@		!
814	oenone	oenone	UBQ	VC	ATE	TOF	KRO	3PT	ABU	BOB	BUN	gam	@		!
815	hierta	cebrene	SUD	CO	ooo	ooo	kro	ooo	abu	ooo	•	GAM	@		!
816	cymodoce	cymodoce	MEF	NR	ATE	tof	KRO	3pt	ABU	BOB	•	—	@		!
817	westermanni	westermanni	DRF	NR	ATE	TOF	KRO	ooo	—	ooo	•	—			!
818	hadrope		DRF	RA	—	—	—	—	—	—	•	—		vo	
819	sophia	sophia	ALF	CO	ATE	tof	KRO	3PT	abu	BOB	•	ooo	@		!
820	stygia		ALF	CO	ATE	TO5	KRO	3pt	—	BOB	•	—	@		!
822	chorimene		GUI	CO	ooo	ooo	KRO	3pt	ABU	bob	•	GAM	@		!
823	terea	terea	ALF	VC	ATE	TO5	KRO	3PT	ABU	BOB	BUN	GAM	@		!
CATACROPTERA															
824	cloanthe	ligata	GUI	NR	ate	TO5	kro	ooo	ABU	ooo	•	GAM	@		!
CYRESTINAE															
CYRESTIS															
825	camillus	camillus	ALF	CO	ATE	tof	KRO	3pt	ooo	BOB	•	—	@		!
BIBLIDINAE															
BYBLIA															
826	anvatara	crameri	UBQ	CO	ATE	TO5	KRO	3PT	abu	BOB	•	GAM	@		!
827	ilithyia		SUD	RA	—	—	—	—	—	—	—	gam			
MESOXANTHA															
828	ethosea	ethosea	MEF	NR	ATE	tof	kro	3pt	—	BOB	BUN	—	@		!
ARIADNE															
829	enotrea	enotrea	ALF	VC	ATE	TO5	KRO	3pt	ABU	BOB	•	—	@		!
830	albifascia		ALF	NR	ATE	tof	KRO	3pt	ABU	bob	•	—	@		!
NEPTIDOPSIS															
833	ophione	ophione	ALF	CO	ATE	TO5	KRO	3PT	ABU	BOB	•	—	@		!

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
EURYTELA														
834 dryope	dryope	DRF	NR	ATE	TO5	KRO	3pt	ABU	BOB	•	ooo	@		!
836 hiarbas	hiarbas	MEF	CO	ATE	TO5	KRO	3PT	ABU	BOB	•		@		!
SEVENIA	check													
837 occidentalium	occidentalium	ALF	NR	ATE	tof	kro	3pt	ooo	bob	•	—			!
838 boisduvali	omissa	ALF	NR	ATE	tof	kro	3pt	ooo	ooo	•	—			!
839 umbrina		DRF	NR	—	tof	kro	ooo	ooo	—	—	—			!
LIMENITIDINAE														
HARMA														
843 theobene	theobene	MEF	CO	ATE	TO5	KRO	3PT	ABU	BOB	•	—	@		!
CYMOTHOE														
846 fumana	fumana	MEF	CO	ATE	TO5	KRO	3PT	—	BOB	•	—	@		!
851 egesta	egesta	MEF	CO	ATE	TO5	KRO	3PT	—	BOB	•	—	@		!
853 lurida	lurida	WEF	VR	ATE	tof	ooo	ooo	—	—	—	—			
858 aubergeri		MEF	NR	—	—	ooo	—	—	—	—	—		en	!
859 herminia	gongoa	MEF	RA	ATE	TOF	KRO	ooo	—	—	—	—			!
860 weymeri	mulatta	WEF	RA	ATE	TOK	kro	3PT	—	—	—	—			
863 caenis		ALF	CO	ATE	TOF	KRO	3pt	ABU	BOB	•	—	@		!
866 althea	althea	MEF	NR	ooo	tof	kro	3pt	—	ooo	•	—			!
868 jodutta		WEF	CO	ATE	TOK	ooo	3pt	—	ooo	•	—			!
872 coccinata	coccinata	MEF	NR	ATE	TO5	KRO	ooo	—	ooo	•	—	@		!
873 mabillei		MEF	CO	ATE	TOF	KRO	3PT	abu	BOB	BUN	—	@	ww	!
878 'sangaris'		WEF	NR	ATE	TOF	kro	ooo	—	—	—	—			!
PSEUDONEPTIS														
879 bugandensis	ianthe	ALF	CO	ATE	tof	KRO	3PT		BOB	BUN	—	@		!
PSEUDACRAEA														
880 eurytus		ALF	CO	ATE	tof	KRO	3PT	ABU	BOB	BUN	—	@		!
884 boisduvalii	boisduvalii	DRF	NR	ate	TOF	kro	3pt	ABU	BOB	•	—	@		!
887 lucretia	lucretia	ALF	CO	ATE	TO5	KRO	3PT	ABU	BOB	•	—	@		!
888 warburgi		MEF	NR	ATE	tof	kro	3pt	—	BOB	•	—			!
889 hostilia		WEF	RA	ATE	tof	ooo	ooo	—	ooo	•	—		ww	!
900 semire		ALF	CO	ATE	tof	kro	3pt	abu	bob	BUN	—	@		!

LOCALITIES		subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM		
NEPTIS														
901	nemetes	nemetes	ALF	CO	ATE	tof	KRO	3PT	ABU	BOB	BUN	—	@	!
903	metella	metella	ALF	CO	ATE	TO5	kro	3PT	ABU	BOB	BUN	—	@	!
905	serena	serena	DRF	NR	ATE	tof	kro	3PT	ABU	bob	•	GAM	@	!
906	kiriakoffi		DRF	NR	ate	tof	kro	3pt	abu	ooo	•	gam	@	!
907	morosa		GUI	CO	ate	TO5	kro	3pt	ABU	ooo	•	GAM	@	!
908	loma		MEF	RA	ATE	tof	ooo	ooo	—	ooo	•	—		
910	angusta		MEF	VR	—	—	—	—	—	—	—	—		
911	alta		MEF	NR	ATE	tof	kro	3pt	ABU	bob	•	—		!
912	seeldrayersi		MEF	RA	ATE	tof	kro	3pt	—	bob	•	—		!
913	puella		MEF	NR	ATE	tof	kro	3pt	—	bob	•	—		!
914	conspicua		MEF	RA	ate	tof	ooo	—	—	ooo	•	—		
915	najo		MEF	RA	ate	tof	kro	3pt	abu	ooo	•	—		!
916	metanira		MEF	RA	ate	tof	kro	3pt	—	ooo	•	—		!
917	continuata		MEF	???	ate	tof	ooo	ooo	—	ooo	•	—		
918	nysiades		MEF	NR	ATE	TO5	KRO	3pt	abu	BOB	•	—	@	!
921	nicomedes		MEF	RA	ATE	tof	kro	3pt	ooo	bob	•	—		!
922	quintilla		MEF	RA	ATE	tof	kro	3pt	ooo	ooo	•	—		!
926	paula		WEF	RA	ATE	tof	kro	3pt	—	ooo	•	—		!
927	strigata	strigata	MEF	RA	ATE	tof	kro	3pt	—	BOB	•	—	@	!
929	nicoteles		MEF	CO	ATE	tof	kro	3PT	ABU	bob	•	—	@	!
930	nicobule		MEF	NR	ATE	tof	kro	3pt	—	bob	•	—		!
931	mixophyes		WEF	RA	ATE	tof	kro	3PT	—	ooo	•	—		!
933	nebrodes		MEF	NR	ATE	tof	kro	3pt	—	bob	•	—	@	!
934	trigonophora	melicertula	MEF	NR	ATE	tof	kro	3pt	ooo	bob	•	—	@	!
936	agouale	agouale	ALF	VC	ATE	tof	KRO	3pt	ABU	BOB	•	—	@	!
937	melicerta		MEF	CO	ATE	TO5	KRO	3PT	ABU	bob	BUN	—	@	!
938	troundi		MEF	CO	ATE	TO5	kro	3pt	ooo	BOB	•	—	@	!
CATUNA														
941	crithea		ALF	VC	ATE	TO5	KRO	3PT	ABU	BOB	BUN	—	@	!
942	niji		WEF	RA	—	TO5	KRO	3PT	—	—	—	—	@	!
943	oberthueri		ALF	CO	ATE	tof	KRO	3PT	ooo	bob	BUN	—	@	!
944	angustatum		MEF	CO	ATE	TO5	KRO	3pt	ABU	bob	•	—	@	!

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
EURYPHURA														
946 togoensis		MEF	NR	ATE	tof	kro	3pt	—	ooo	•	—			!
948 chalcis		ALF	CO	ATE	TOF	KRO	3PT	—	BOB	•	—	@		!
HAMANUMIDA														
951 daedalus		GUI	CO	ATE	TO5	KRO	3PT	ABU	ooo	•	GAM	@		!
ATERICA														
953 galene	galene	ALF	CO	ATE	TO5	KRO	3PT	ABU	BOB	BUN	ooo	@		!
CYNANDRA														
954 opis	opis	MEF	NR	ATE	tof	kro	3pt	ooo	bob	•	—			!
EURIPHENE														
959 incerta	incerta	WEF	RA	ATE	tof	kro	ooo	—	ooo	•	—			!
960 barombina		ALF	VC	ATE	TO5	KRO	3PT	ooo	BOB	BUN	—	@		!
961 veronica		WEF	CO	—	—	—	—	—	—	—	—		ww	!
964 grosesmithi	muehlenbergi	MEF	RA	ooo	ooo	ooo	ooo	—	—	—	—			!
968 simplex		WEF	NR	ATE	tof	kro	3pt	—	BOB	•	—		ww	!
974 amicia	amicia	MEF	NR	ATE	tof	kro	3pt	—	BOB	•	—	@		!
976 aridatha	transgressa	MEF	NR	ATE	tof	kro	3pt	ooo	BOB	•	—	@		!
978 coerulea		WEF	CO	ATE	tof	kro	3PT	—	BOB	•	—	@		!
985 ernestibaumanni		WEF	RA	ooo	ooo	ooo	ooo	—	ooo	•	—			
986 gambiae	vera	ALF	CO	ATE	tof	KRO	3pt	ooo	BOB	•	—	@		!
987 ampedusa		ALF	NR	ATE	tof	KRO	3PT	ABU	BOB	•	—	@		!
988 leonis		WEF	VR	—	—	ooo	3PT	—	—	—	—	@	ww	!
989 atossa	atossa	MEF	NR	ATE	tof	KRO	3pt	—	bob	•	—			!
990 doriclea	doriclea	MEF	NR	ATE	tof	kro	3pt	—	bob	•	—			!
BEBEARIA														
994 lucayensis		MEF	RA	ATE	tof	kro	3pt	—	bob	•	—			!
995 tentyris		MEF	CO	ATE	TOK	KRO	3pt	ooo	BOB	•	—	@		!
996 osyris		WEF	NR	ATE	TOK	kro	3PT	—	ooo	•	—		ww	!
998 carshena		MEF	NR	ATE	tof	kro	3pt	—	BOB	•	—			!
999 absolon	absolon	ALF	CO	ATE	TO5	KRO	3pt	ABU	BOB	•	—	@		!
1001 zonara		MEF	CO	ATE	TO5	KRO	3pt	ooo	BOB	•	—	@		!
1002 mandinga	mandinga	ALF	CO	ATE	tof	KRO	3pt	ABU	BOB	•	—	@		!
1003 oxione	oxione	MEF	NR	ATE	TO5	KRO	3pt	ABU	BOB	BUN	—	@		!
1004 abesa	abesa	MEF	NR	ATE	TOK	KRO	3pt	—	BOB	•	—	@		!

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
1006 barce	barce	WEF	RA	ATE	tof	kro	3pt	—	BOB	•	—			!
1008 mardania		ALF	CO	ATE	tof	kro	3PT	ABU	BOB	•	—	@		!
1011 cocalia	cocalia	ALF	CO	ATE	TOK	kro	3PT	ABU	BOB	•	—	@		!
1012 paludicola	blandi	MEF	NR	ATE	TOK	kro	3pt	—	BOB	•	—	@		!
1014 sophus	phreone	ALF	CO	ATE	TOK	KRO	3PT	ABU	BOB	BUN	—	@		!
1017 arcadius		WEF	RA	ATE	tof	kro	3PT	—	ooo	•	—		ww	!
1021 laetitia	laetitia	WEF	CO	ATE	tof	kro	3PT	—	bob	•	—			!
1027 phantasina		ALF	CO	ATE	tof	KRO	3PT	ooo	bob	•	—	@		!
1029 demetra	demetra	MEF	RA	ate	tof	KRO	3pt	—	BOB	•	—			!
1033 maledicta		WEF	VR	ATE	tof	kro	ooo	—	ooo	•	—			
1035 ashantina		WEF	RA	ATE	tof	kro	3pt	—	ooo	•	—		en	!
1037 cutteri	cutteri	WEF	RA	ATE	TOF	ooo	3PT	—	ooo	•	—			!
EUPHAEDRA														
Subgenus Medoniana														
1046 medon	medon	ALF	CO	ATE	TO5	KRO	3PT	ABU	BOB	BUN	—	@		!
Subgenus Gausapia														
1047 gausape		WEF	NR	ATE	tof	kro	3PT	—	BOB	•	—		ww	!
1047 mariaechristinae		WEF	NR	ATE	tof	KRO	ooo	—	bob	•	—		en	!
Subgenus Xypetana														
1055 xypete		MEF	CO	ATE	tof	KRO	3PT	ooo	BOB	•	—	@		!
1057 hebes		WEF	NR	ATE	tof	kro	3pt	—	BOB	•	—			!
1059 diffusa	albocoerulea	DRF	NR	ATE	tof	kro	3pt	abu	bob	•	—	@		!
1060 crossei	akani	DRF	RA	—	tof	kro	—	—	—	—	—			!
1061 crockeri	crockeri	MEF	NR	ATE	TO5	KRO	3pt	—	ooo	•	—	@	ww	!
Subgenus Radia														
1062 eusemoides		WEF	VR	ATE	tof	ooo	—	—	—	—	—		ww	
Subgenus Euphaedra														
1064 cyparissa	cyparissa	DRF	NR	ATE	tof	kro	3pt	—	ooo	•	—	@		!
1065 sarcoptera	sarcoptera	MEF	NR	ATE	TOK	kro	3pt	ooo	BOB	•	—	@		!
Subgenus Euphaedrana														
1066 themis	themis	DRF	NR	ATE	TOK	kro	3pt	ABU	BOB	•	—	@		!
1067 laboureana	eburnensis	WEF	RA	ATE	tof	kro	3pt	—	bob	•	—		ww	!
1071 minuta		WEF	RA	ooo	tof	kro	3pt	—	—	—	—	@	en	!
1072 modesta		WEF	NR	ATE	tof	kro	3PT	—	—	—	—		en	!

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
1075 janetta		ALF	CO	ATE	TOF	KRO	3PT	ABU	BOB	•	—	@		!
1076 splendens		WEF	RA	ATE	tof	ooo	ooo	—	ooo	•	—			!
1077 aberrans		WEF	VR	ooo	ooo	—	—	—	—	—	—		ww	
1078 vetusta		WEF	VR	ooo	ooo	ooo	3pt	—	—	—	—		ww	!
1083 ceres	ceres	ALF	CO	ATE	TOK	KRO	3PT	ABU	BOB	BUN	—	@		!
1085 phaethusa	phaethusa	ALF	CO	ATE	TOF	KRO	3pt	ABU	BOB	BUN	—	@	ww	!
1086 inanum		MEF	RA	ATE	tof	KRO	3pt	ooo	BOB	•	—		ww	!
1096 ignota		WEF	VR	ATE	tof	ooo	ooo	—	—	—	—		en	!
1106 francina	francina	WEF	NR	ATE	TOK	ooo	3pt	—	—	—	—		ww	!
1108 eleus	eleus	WEF	NR	ATE	TOK	kro	3PT	—	BOB	•	—	@		!
1112 zampa		WEF	NR	ATE	tof	kro	3pt	—	—	—	—		ww	!
1115 edwardsii		ALF	CO	ATE	TOK	KRO	3pt	ABU	BOB	•	—	@		!
1116 ruspina		WEF	NR	—	—	—	—	—	—	—	—			!
1117 perseis		WEF	NR	ATE	TOK	KRO	3PT	—	BOB	•	—		ww	!
1118 harpalyce	harpalyce	ALF	VC	ATE	TO5	KRO	3PT	ABU	BOB	BUN	—	@		!
1119 eupalus		WEF	RA	ATE	tof	kro	3pt	—	BOB	•	—		ww	!
EUPTERA														
1121 crowleyi	crowleyi	ALF	RA	ate	tof	kro	ooo	—	ooo	•	—			
1122 elabontas	elabontas	ALF	NR	ate	tof	KRO	3pt	—	ooo	•	—			!
1123 dorothea	warrengashi	MEF	VR	—	—	ooo	—	—	—	—	—		en	!
1124 zowa		ALF	NR	ate	tof	kro	3pt	—	bob	•	—	@		!
PSEUDATHYMA														
1133 falcata		MEF	RA	ATE	tof	kro	3pt	—	bob	•	—			!
1134 sibyllina		MEF	RA	ATE	tof	kro	ooo	—	bob	•	—			!
HELICONIINAE														
ACRAEA														
Subgenus Actinote														
1139 perenna	perenna	MEF	NR	ATE	tof	ooo	ooo	—	ooo	•	—			!
1144 circeis		ALF	CO	ATE	tof	KRO	3PT	ABU	bob	BUN	—	@		!
1147 translucida		MEF	NR	ATE	ooo	—	—	—	—	—	—			!
1148 peneleos	peneleos	ALF	NR	ATE	TOF	KRO	ooo	ABU	bob	•	—			!
1149 parrhasia	parrhasia	MEF	NR	ATE	tof	KRO	3pt	ABU	bob	•	—			!
1150 orina		MEF	RA	ATE	TO5	kro	3pt	—	bob	•	—	@		!

LOCALITIES		subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
1152	pharsalus	pharsalus	ALF	CO	ATE	tof	KRO	3pt	ABU	BOB	BUN	—	@		!
1153	encedon	encedon	UBQ	CO	ATE	tof	kro	3pt	ABU	BOB	•	gam	@		!
1154	encedana		SPE	NR	ooo	tof	ooo	3pt	abu	ooo	•	ooo	@		!
1155	alciope		ALF	VC	ATE	TO5	KRO	3PT	ABU	BOB	BUN	—	@		!
1156	aurivillii	aurivillii	ALF	NR	ATE	TO5	kro	3pt	—	bob	•	—	@		!
1157	jodutta	jodutta	ALF	CO	ATE	TO5	KRO	3PT	ABU	bob	BUN	—	@		!
1158	lycoa	lycoa	ALF	CO	ATE	tof	KRO	3PT	ABU	bob	BUN	—	@		!
1159	serena		UBQ	CO	ATE	TOF	KRO	3PT	ABU	BOB	•	GAM	@		!
1160	acerata		ALF	NR	ATE	tof	kro	3pt	ABU	bob	•	gam	@		!
1161	pseudepaea		WEF	RA	ATE	tof	kro	ooo	—	ooo	•	—			!
1165	bonasia	bonasia	ALF	CO	ATE	tof	kro	3PT	ABU	BOB	•	—	@		!
1167	orestia	orestia	MEF	RA	ATE	tof	KRO	3pt	abu	BOB	BUN	—	@		!
1168	polis		MEF	NR	ATE	TOF	kro	3PT	ABU	BOB	•	—	@		!
1169	vesperalis		WEF	VR	ATE	tof	ooo	ooo	—	ooo	•	—			!
Subgenus Acraea															
1172	kraka	kibi	WEF	RA	ATE	TOF	—	—	—	—	—	—			
1173	rogersi	rogersi	WEF	NR	ATE	TOF	kro	3pt	ABU	BOB	•	—			!
1174	abdera	eginopsis	MEF	RA	ate	tof	kro	ooo	ABU	bob	•	—			!
1176	egina	egina	ALF	CO	ATE	tof	KRO	3PT	ABU	BOB	•	gam	@		!
1178	pseudegina		UBQ	CO	ATE	TO5	KRO	3PT	ABU	bob	•	gam	@		!
1179	caecilia	caecilia	SUD	CO	ooo	tof	kro	—	ooo	ooo	•	GAM	@		!
1180	zetes	zetes	DRF	NR	ATE	tof	kro	3pt	ABU	bob	•	ooo	@		!
1181	endoscota		ALF	RA	ATE	tof	kro	3pt	—	bob	•	—			!
1182	leucographa		MEF	NR	ATE	tof	kro	3pt	—	ooo	•	—			!
1184	quirina	quirina	ALF	CO	ATE	tof	kro	3PT	ABU	bob	•	—	@		!
1185	neobule	neobule	UBQ	CO	ATE	tof	kro	3PT	ABU	bob	•	GAM	@		!
1186	eugenia		DRF	NR	—	—	—	—	—	—	—	—			!
1187	camaena		DRF	RA	—	tof	kro	ooo	ooo	ooo	•	—			!
1188	vestalis	vestalis	ALF	NR	ATE	tof	kro	3PT	ABU	BOB	•	—	@		!
1189	macaria		WEF	RA	ATE	tof	ooo	ooo	—	ooo	•	—		ww	!
1190	umbra	umbra	MEF	NR	ATE	tof	KRO	3PT	ABU	bob	•	—	@		!
1191	alcinoe	alcinoe	MEF	CO	ATE	tof	kro	3pt	abu	bob	•	—	@		!
1192	consanguinea	sartina	WEF	RA	ooo	tof	ooo	ooo	—	ooo	•	—			!
1196	epaea	epaea	ALF	CO	ATE	TOF	KRO	3PT	ABU	bob	•	—	@		!

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
LACHNOPTERA														
1199 anticlia		MEF	CO	ATE	tof	KRO	3PT	—	BOB	BUN	—	@		!
PHALANTA														
1200 phalantha	aethiopica	UBQ	CO	ATE	TO5	kro	3pt	ABU	BOB	•	GAM	@		!
1201 eurytis	eurytis	MEF	CO	ATE	tof	KRO	3PT	ooo	bob	•	—	@		!
HESPERIIDAE														
COLIADINAE														
COELIADES														
1203 chalybe	chalybe	ALF	CO	ATE	tof	kro	3PT	ABU	BOB	•	—	@		!
1204 bixana		MEF	RA	ate	tof	kro	3pt	ABU	ooo	•	—			!
1206 libeon		ALF	NR	ATE	tof	kro	3pt	abu	ooo	•	—			
1207 forestan	forestan	UBQ	CO	ATE	tof	KRO	3PT	ABU	BOB	•	GAM	@		!
1208 pisistratus		ALF	CO	ATE	tof	kro	3PT	ABU	bob	•	gam	@		!
1209 hanno		MEF	NR	ATE	tof	kro	3pt	ABU	bob	•	—	@		!
PYRRHIADES														
1210 lucagus		DRF	CO	—	—	—	3PT	—	—		GAM	@	en	!
PYRRHOCHALCIA														
1211 iphis		ALF	CO	ATE	tof	kro	3PT	ABU	bob	•	—	@		!
PYRGINAE														
LOXOLEXIS														
1212 holocausta		WEF	VR	ATE	tof	ooo	ooo	—	ooo	•	—			
1213 dimidia		WEF	VR	ooo	tof	kro	—	—	—	—	—			
1214 hollandi		WEF	RA	ATE	tof	kro	3PT	—	ooo	•	—			!
KATREUS														
1215 johnstonii		WEF	RA	ATE	tof	kro	ooo	—	ooo	•	—			!
CELAENORRHINUS														
1216 rutilans		WEF	RA	ATE	tof	ooo	—	—	ooo	•	—			
1217 sagamase		WEF	VR	ATE	tof	ooo	—	—	ooo	•	—		en	!
1219 leona		WEF	RA	ATE	tof	kro	3PT	—	ooo	•	—	@	ww	!
1223 ankasa		WEF	VR	ATE	tof	ooo	ooo	—	—	—	—		en	!
1224 galenus	galenus	ALF	CO	ATE	TO5	kro	3PT	ABU	BOB	BUN	—	@		!
1225 cf galenus	galenus	WEF	RA	ATE	tof	KRO	ooo	—	ooo	•	—			!

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM		
1226 meditrina		WEF	RA	ATE	tof	kro	ooo	—	bob	•	—		
1227 ovalis		WEF	RA	ATE	tof	kro	ooo	—	ooo	•	—		!
1230 proxima	maesseni	ALF	CO	ATE	tof	kro	3pt	ABU	bob	•	—	@	!
1231 plagiatus		MEF	NR	ATE	tof	KRO	3pt	—	bob	•	—	@	!
TAGIADES													
1232 flesus		ALF	CO	ATE	tof	KRO	3PT	ABU	BOB	BUN	GAM	@	!
EAGRIS													
1233 denuba	denuba	ALF	CO	ATE	TOF	KRO	3pt	ABU	BOB	•	—	@	!
1234 decastigma		WEF	RA	ATE	tof	kro	ooo	—	ooo	•	—		
1235 tigris	liberti	WEF	RA	ATE	tof	kro	3pt	—	ooo	•	—		!
1236 subalbida	subalbida	WEF	RA	ATE	tof	kro	3pt	ooo	BOB	•	—	@	!
1237 hereus	quaterna	MEF	NR	ATE	tof	kro	3pt	—	bob	•	—		!
1238 tetrastigma	subolivescens	MEF	NR	ATE	TOF	kro	3pt	ooo	BOB	•	—		!
CALLEAGRIS													
1239 lacteus	dannatti	WEF	NR	ate	tof	kro	3PT	—	ooo	•	—		!
PROCAMPTA													
1241 rara		MEF	NR	ATE	tof	KRO	3pt	ABU	bob	•	—		!
ERETIS													
1242 lugens		GUI	CO	ATE		kro	—	abu	—	—	GAM	@	!
1243 plistonicus		ALF	NR	ATE	TO5	KRO	3pt	ABU	bob	BUN	—	@	!
1244 melania		DRF	NR	ate	tof	KRO	ooo	ABU	ooo	•	gam	@	!
SARANGESA													
1245 laelius		GUI	NR	—	—	kro	—	—	—	—	GAM	@	!
1246 phidyle		SUD	NR	—	—	—	—	—	—	—	gam		
1247 tertullianus		MEF	NR	ate	tof	kro	3pt	ooo	bob	•	—		!
1248 majorella		MEF	NR	ate	tof	kro	3pt	abu	bob	•	—	@	!
1249 tricerata	tricerata	MEF	NR	ooo	tof	kro	ooo	ABU	bob	•	—		!
1250 thecla	thecla	ALF	CO	ATE	tof	KRO	3PT	ABU	BOB	•	—	@	!
1251 bouvieri		DRF	CO	ATE	TOF	kro	3pt	ABU	BOB	•	—	@	!
1252 brigida	brigida	MEF	NR	ATE		kro	3pt	ABU	bob	•	—		!

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
CAPRONA														
1253 adelica		GUI	RA	—	—	ooo	—	ooo	—	—	gam	@		!
1254 pillaana		SUD	VR	—	—	—	—	—	—	—	GAM	@		!
NETROBALANE														
1255 canopus		GUI	RA	—		—	—	ooo	—	—	gam			
ABANTIS														
1256 bismarcki		GUI	RA	—			—	—	—	—	gam			
1257 leucogaster	leucogaster	WEF	RA	ATE	TOF	kro	3PT	—	ooo	•		@		!
1258 nigeriana		GUI	NR	ooo	ooo	kro	ooo	ooo	ooo	•	GAM	@		!
1259 pseudonigeriana		SUD	RA	—	—	—	—	—	—	—	gam			!
1261 lucretia	lucretia	MEF	RA	ATE	tof	kro	3pt	—	ooo	•	—			!
1262 elegantula	elegantula	DRF	RA	ATE	tof	kro	ooo	—	ooo	•	—			!
1263 ja		WEF	VR	ATE	ooo	ooo	ooo	—	—	—	—			
1263 tanobia		WEF	VR	ooo	TOF	kro	—	—	—	—	—		en	
SPIALIA														
1265 spio		SUD	CO	ooo	tof	kro	ooo	ooo	ooo	•	GAM			!
1267 diomus	diomus	SUD	NR	ooo	tof	kro	ooo	ooo	ooo	•	GAM			!
1268 dromus		GUI	NR	ooo	tof	kro	ooo	ooo	ooo	•	gam			!
1269 ploetzi	occidentalis	ALF	NR	ATE	tof	KRO	3pt	abu	bob	•	—	@		!
GOMALIA														
1270 elma	elma	DRF	NR	ooo	tof	kro	ooo	ABU	ooo	•	gam	@		!
HESPERIINAE														
ASTICTOPTERUS														
1276 anomoeus		WEF	NR	ATE	ooo	ooo	ooo	ABU	—	—	—		ww	!
1277 abjecta		GUI	CO	ooo	tof	kro	—	ooo	—	—	gam	@		!
PROSOPALPUS														
1278 debilis		MEF	RA	ATE	tof	kro	3pt	abu	ooo	•	—	@		!
1279 styla		DRF	NR	ate	tof	kro	3pt	ooo	ooo	•	—	@		!
1280 saga		WEF	RA	ate	tof	kro	3pt	—	ooo	•	—			!
KEDESTES														
1282 protensa		GUI	VR	—	—	—		—			gam			
GORGYRA														
1284 aretina		ALF	NR	ATE	tof	kro	3pt	ABU	bob	•	—			!

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
1285 heterochrus		MEF	NR	ate	tof	kro	3pt	—	bob	•	—			!
1286 mocquerysii		ALF	NR	ATE	tof	kro	3pt	ABU	bob	•	—	@		!
1287 aburae		WEF	RA	ATE	tof	kro	3pt	ABU	ooo	•	—			
1289 bina		MEF	NR	ATE	tof	kro	3pt	ABU	bob	•	—			!
1290 sola		MEF	RA	ooo	tof	kro	ooo	—	ooo	•	—			!
1291 afikpo		MEF	VR	ATE	tof	kro	3pt	—	ooo	•	—			
1292 diversata		MEF	NR	ate	tof	kro	3pt	ABU	bob	•	—	@		!
1293 bule		MEF	RA	ooo	tof	kro	3pt	ooo	bob	•	—			
1294 minima		DRF	NR	ooo	tof	kro	ooo	abu	ooo	•	GAM	@		!
1295 sara		ALF	NR	ATE	tof	kro	3pt	abu	bob	•	—			!
1296 subfacatus		ALF	NR	ATE	tof	kro	3pt	ABU	ooo	•	—	@		!
1297 pali		MEF	RA	ATE	tof	kro	3pt	—	ooo	•	—			!
GYROGRA														
1299 subnotata		ALF	NR	ATE	tof	kro	3pt	abu	bob	•	—	@		!
CERATRICHIA														
1301 phocion	phocion	MEF	CO	ATE	TOF	KRO	3PT	ooo	bob	•	—	@		!
1302 semilutea		MEF	RA	ATE	tof	kro	3pt	abu	ooo	•	—			!
1303 clara	clara	WEF	NR	ATE	tof	KRO	3pt	—	ooo	•	—			!
1305 crowleyi		WEF	RA	—	—	—	ooo	—	—	—	—		ww	!
1306 nothus	nothus	WEF	NR	ate	TO5	kro	3pt	—	bob	•	—	@		!
1307 argyrosticta	argyrosticta	WEF	NR	ATE	tof	KRO	3pt	ABU	bob	•	—			!
1308 maesseni		WEF	RA	ATE	TOF	kro	3pt	—	bob	•	—		en	!
TENIORHINUS														
1309 watsoni		MEF	RA	ate	tof	kro	3pt	ooo	bob	•	—			!
1310 ignita		MEF	NR	ooo	tof	kro	ooo	ooo	bob	•	—			
PARDALEODES														
1311 incerta	murcia	GUI	CO	ooo	tof	KRO	ooo	ABU	ooo	•	gam	@		!
1312 edipus		ALF	VC	ATE	tof	KRO	3PT	ABU	BOB	BUN	—	@		!
1313 sator	sator	MEF	NR	ATE	TO5	KRO	3PT	ABU	BOB	•	—	@		!
1314 tibullus	tibullus	MEF	NR	ATE	tof	KRO	3pt	ABU	BOB	•	—	@		!
1315 xanthopeplus		WEF	VR	ATE	TO5	ooo	ooo	—	—	—	—			
XANTHODISCA														
1317 rega		ALF	NR	ate	TO5	KRO	3PT	ABU	bob	•	—	@		!
1318 astrape		MEF	NR	ATE	tof	kro		ooo	bob	•	—	@		!

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
PAROSMODES														
1320 morantii	axis	SUD	RA	—	—	—	—	—	—	—	—			!
1321 lentiginosa		ALF	RA	ATE	TOF	kro	ooo	ooo	ooo	•	—			!
RHABDOMANTIS														
1322 galatia		MEF	NR	ATE	tof	kro	3pt	ooo	bob	•	—			!
1323 sosia		MEF	NR	ATE	tof	kro	3pt	ABU	bob	•	—			!
OSMODES														
1324 laronia		ALF	CO	ATE	TOF	KRO	3pt	abu	BOB	•	—	@		!
1325 omar		DRF	NR	ate	tof	kro	3pt	ooo	bob	•	—	@		!
1326 lux		WEF	NR	ATE	tof	kro	3pt	—	bob	•	—			!
1328 thora		ALF	CO	ATE	TO5	KRO	3pt	ABU	BOB	•	—	@		!
1329 distincta		WEF	RA	ATE	tof	kro	3pt	—	ooo	•	—			
1330 adon		WEF	RA	ATE	TOF	kro	3pt	—	bob	•	—			!
1332 adosus		WEF	RA	ATE	tof	kro	3pt	—	bob	•	—			!
1333 lindseyi	occidentalis	MEF	NR	ATE	tof	kro	3pt	ooo	bob	•	—	@		!
1334 costatus		WEF	RA	ATE	TOF	kro	3pt	—	ooo	•	—			!
1335 banghaasi		WEF	RA	ATE	TOF	kro	3pt	—	ooo	•	—			!
OSPHANTES														
1336 ogowena	ogowena	WEF	VR	ate	tof	kro	3pt	—	ooo	•	—			!
PARACLEROS														
1337 placidus		MEF	NR	ate	tof	kro	3PT	ABU	bob	•	—	@	ww	!
1338 biguttulus		ALF	CO	ATE	tof	KRO	3PT	ABU	bob	•	—	@		!
1339 substrigata		MEF	RA	ate	TO5	kro	3pt	—	bob	•	—	@		!
1340 maesseni		MEF	NR	ATE	tof	kro	3pt	—	bob	•	—			!
ACLEROS														
1341 ploetzi		ALF	CO	ATE	tof	kro	3pt	ABU	BOB	•	—			
1342 mackenii	olaus	ALF	CO	ATE	tof	kro	3pt	ABU	bob	•	—	@		!
1343 nigrapex		MEF	NR	ATE	tof	kro	3pt	abu	bob	•	—	@		!
1344 bala		MEF	RA	ate	tof	ooo	3pt	—	ooo	•	—		en	!
SEMALEA														
1345 pulvina		ALF	CO	ATE	tof	kro	3pt	ABU	bob	•	—	@		!
1346 sextilis		WEF	NR	ATE	TPF	kro	3pt	ABU	bob	•	—			!
1347 atrio		WEF	RA	ATE	tof	kro	3pt	—	ooo	•	—			!
1349 arela		DRF	NR	ATE	TO5	kro	3pt	ABU	bob	•	—	@		!

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM		
HYPOLEUCIS													
1350 ophiusa	ophiusa	ALF	CO	ATE	tof	kro	3pt	abu	BOB	•	—	@	!
1351 tripunctata	tripunctata	MEF	NR	ATE	tof	kro	3pt	—	bob	•	—		!
1352 sophia		WEF	RA	ate	TOF	kro	3pt	—	ooo	•	—		!
MEZA													
1353 indusiata		MEF	NR	ate	tof	kro	3pt	ooo	bob	•	—		!
1354 meza		ALF	VC	ATE	tof	KRO	3PT	ABU	BOB	BUN	—	@	!
1355 mabea		MEF	VR	ooo	ooo	ooo	—	—	ooo	•	—		
1356 leucophaea		MEF	NR	ATE	TOF	kro	3pt	ooo	ooo	•	—	@	!
1357 elba		MEF	RA	ATE	tof	kro	3pt	abu	bob	•	—		!
1358 mabillei		WEF	RA	ATE	tof	kro	3pt	—	bob	•	—		!
1359 cybeutes	volta	ALF	NR	ATE	tof	kro	3pt	ooo	bob	•	—	@	!
PARONYMUS													
1361 xanthias	xanthias	WEF	RA	ATE	tof	kro	3pt	—	bob	•	—		!
1363 ligora		MEF	NR	ATE	tof	kro	3pt	abu	bob	•	—	@	!
1364 nevea		WEF	VR	ooo	ooo	ooo	—	—	—	•	—		!
ANDRONYMUS													
1365 neander		ALF	NR	ATE	tof	kro	3pt	abu	bob	•	—	@	!
1367 caesar	caesar	ALF	CO	ATE	tof	kro	3pt	abu	BOB	•	—	@	!
1368 hero		MEF	NR	ATE	tof	kro	3pt	ooo	BOB	•	—	@	!
1369 helles		MEF	NR	ATE	tof	kro	3PT	ooo	bob	•	—	@	!
1370 evander		MEF	NR	ATE	tof	kro	3pt	ooo	BOB	•	—	@	!
ZOPHOPETES													
1373 ganda		DRF	RA	ooo	TOF	ooo	ooo	ooo	—	—	—		
1374 cerymica		ALF	NR	ATE	tof	kro	3pt	abu	bob	•	—		!
1376 quaternata		DRF	RA	ooo	ooo	kro	ooo	ooo	ooo	•	—		
GAMIA													
1377 buchholzi		WEF	NR	ATE	tof	kro	3pt	ABU	bob	•	—	@	!
1378 shelleyi		WEF	NR	ate	tof	kro	3pt		bob	•	—		!
ARTITROPA													
1379 comus		MEF	NR	ATE	tof	kro	3pt	ABU	bob	•	—		!
MOPALA													
1380 orma		MEF	RA	ate	tof	kro	3pt	—	BOB	•	—	@	!

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM		
GRETNA													
1381 waga		ALF	CO	ate	tof	KRO	3pt	ABU	BOB	•	—	@	!
1383 cylinda		ALF	NR	ate	TOF	kro	3pt	abu	BOB	•	—	@	!
1386 balenge	zowa	MEF	RA	ate	tof	kro	3pt	ABU	BOB	•	—		
PTEROTEINON													
1387 laufella		ALF	CO	ATE	tof	kro	3PT	ABU	BOB	•	—	@	!
1388 iricolor		WEF	RA	ATE	tof	kro	3pt	—	ooo	•	—		!
1389 laterculus		WEF	RA	ate	tof	kro	ooo	—	ooo	•	—		!
1390 capronnieri		WEF	VR	ooo	ooo	ooo	ooo	—	—	—	—		
1391 caenira		ALF	CO	ATE	tof	kro	3PT	ABU	bob	•	—	@	!
1392 ceucaenira		WEF	RA	ATE	tof	kro	3pt	abu	bob	•	—		!
1393 concaenira		WEF	RA	ate	tof	kro	3pt	—	ooo	•	—		!
1394 pruna		WEF	RA	ate	tof	kro	3pt	—	ooo	•	—		!
LEONA													
1395 binoevatus		WEF	RA	ate	tof	kro	3pt	—	bob	•	—		!
1397 lota		WEF	VR	ooo	ooo	ooo	ooo	—	—	—	—		
1399 leonora	leonora	WEF	RA	ate	tof	kro	3pt	—	bob	•	—		
1401 stoehri		WEF	RA	ate	tof	kro	3pt	—	ooo	•	—		!
1402 meloui		WEF	RA	ate	tof	kro	ooo	—	ooo	•	—		
1403 halma		WEF	???	???	???	???	???	???	???	•	—		
1405 luehderi	luehderi	WEF	RA	ate	tof	kro	ooo	ABU	ooo	•	—		
CAENIDES													
1406 soritia		WEF	RA	ATE	tof	kro	3pt	ooo	bob	•	—	@	!
1407 kangvensis		MEF	NR	ATE	tof	kro	3pt	abu	bob	•	—		!
1408 xychus		MEF	RA	ate	tof	ooo	3pt	—	bob	•	—		!
1409 benga		WEF	RA	ate	ooo	ooo	ooo	—	ooo	•	—		
1410 otilia		WEF	RA	ate	tof	ooo	ooo	—	ooo	•	—		!
1411 dacenilla		MEF	RA	ate	ooo	ooo	ooo	—	ooo	•	—		
1412 dacela		ALF	CO	ATE	tof	kro	3PT	ABU	bob	•	—	@	!
1413 hidarioides		WEF	RA	ATE	TOF	kro	3PT	—	bob	•	—		!
1414 dacena		MEF	CO	ATE	tof	KRO	3pt		bob	•	—		!
MONZA													
1415 alberti		ALF	VC	ATE	tof	kro	£PT	ABU	bob	•	—	@	!
1416 cretacea		ALF	CO	ATE	tof	kro	3pt	ABU	BOB	•	—	@	!

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM			
MELPHINA														
1417 noctula		WEF	RA	ate	tof	kro	3pt	—	ooo	•	—			!
1419 unistriga		WEF	NR	ATE	tof	kro	3pt	ABU	bob	•	—			!
1420 tarace		MEF	RA	ATE	TOF	kro	3pt	ooo	ooo	•	—			
1421 flavina		MEF	RA	ate	tof	kro	3pt	ABU	ooo	•	—			!
1422 statirides		MEF	NR	ATE	tof	kro	3pt	ooo	ooo	•	—			!
1423 statira		WEF	RA	ooo	tof	kro	ooo	ooo	—	—	—			
1425 malthina		WEF	RA	ate	tof	kro	3pt	—	bob	•	—			!
1426 maximiliani		MEF	RA	ooo	ooo	ooo	ooo	—	—	—	—		ww	!
FRESNA														
1427 netopha		DRF	NR	ATE	TOF	kro	3pt	ABU	bob	•	—			!
1428 maesseni		MEF	RA	—	—	—	—	—	—	—	—			
1429 nyassae		DRF	RA	ATE	tof	kro	3pt	abu	bob	•	—			!
1430 cojo		ALF	NR	ATE	tof	kro	3pt	abu	bob	•	—			!
1431 carlo		MEF	VR	ate	tof	kro	ooo	—	—	—	—			!
PLATYLESCHES														
1432 galesa		ALF	NR	ATE	tof	kro	3PT	abu	bob	•	gam			!
1434 moritili		GUI	NR	ate	tof	kro	ooo	abu	ooo	•	GAM			!
1435 rossi		DRF	VR	ooo	tof	kro	ooo	ooo	—	—	ooo		ww	
1437 picanini		ALF	NR	ATE	tof	kro	3pt	abu	bob	•	ooo			!
1438 lamba		MEF	RA	ooo	tof	kro	ooo	—	ooo	•	—			
1439 affinissima		DRF	NR	ooo	tof	kro	ooo	ooo	ooo	•	ooo			
1440 chamaeleon	chamaeleon	DRF	NR	ooo	tof	kro	ooo	ooo	ooo	•	ooo			
1441 batangae		DRF	RA	ooo	—	—	—	—	—	•	ooo			
PELOPIDAS														
1444 mathias		UBQ	CO	ATE	tof	KRO	3pt	ABU	bob	•	GAM	@		!
1445 thrax		UBQ	CO	ATE	tof	kro	3pt	abu	bob	•	gam	@		!
BORBO														
1446 fallax		GUI	NR	ooo	ooo	kro	3pt	abu	ooo	•	gam	@		!
1447 fanta		GUI	NR	ate	tof	KRO	3pt	ABU	BOB	•	GAM	@		!
1448 perobscura		GUI	NR	ATE	TOF	kro	3pt	ABU	ooo	•	gam	@		!
1449 micans		SPE	RA	ATE	tof	kro	3pt	ooo	ooo	•	ooo			!
1450 borbonica	borbonica	GUI	NR	ate	—	kro	—	ooo	ooo	•	GAM			!
1451 gemella		GUI	NR	ooo	tof	kro	ooo	abu	ooo	•	GAM	@		!

LOCALITIES	subspecies	hab	ra	ATE	TOF	KRO	3PT	ABU	BOB	BUN	GAM		
1452 binga		WEF	RA	ooo	tof	kro	3pt	—	ooo	•	—		!
1453 fatuellus	fatuellus	ALF	CO	ATE	tof	kro	3pt	ABU	BOB	•	gam	@	!
1454 holtzi		GUI	NR	ooo	—	kro	—	ABU	ooo	•	GAM		!
PARNARA													
1456 monasi		GUI	RA	ate	tof	kro	3pt	ooo	ooo	•	gam		!
GEGENES													
1457 'pumilio'	gambica	SUD	NR	—	—	—	—	—	—	—	GAM	@	!
1459 niso	brevicornis	GUI	NR	ooo	ooo	kro	ooo	abu	ooo	•	gam		!
1460 hottentota		DRF	NR	ooo	—	kro	—	ooo	ooo	•	gam	@	!

APPENDIX 2

FOREST BUTTERFLIES RECORDED IN SAVANNAH LOCALITIES WITHIN THE PROTECTED AREAS SYSTEM (almost exclusively recorded from riverine vegetation)

LOCALITIES					BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
PAPILIONIDAE												
PAPILIO												
4	dardanus	ALF	NR	#	BOM	BUI	—	—	ooo	KOG	KAL	SHH
11	nireus	ALF	CO	#	BOM	BUI	mol	gbe	dig	KOG	KAL	SHH
12	menestheus	WEF	CO	#	—	ooo	—	—	ooo	ooo	KAL	—
GRAPHIUM												
25	adamastor	DRF	NR	#	BOM	ooo	mol	ooo	dig	KOG	kal	shh
31	policenes	ALF	CO	#	—	ooo	—	—	dig	ooo	kal	SHH
32	liponesco	WEF	NR	#	—	—	—	—	—	—	KAL	—
NEPHERONIA												
45	argia	ALF	CO	#	BOM	BUI	—	—	ooo	ooo	KAL	ooo
46	thalassina	ALF	CO	#	BOM	BUI	—	—	DIG	kog	KAL	shh
47	pharis	ALF	CO	#	ooo	BUI	—	—	—	ooo	KAL	—
BELENOIS												
73	calypso	ALF	VC	#	BOM	BUI	mol	ooo	DIG	KOG	KAL	SHH
APPIAS												
84	sylvia	ALF	CO	#	BOM	BUI	—	—	—	kog	KAL	SHH
LEPTOSIA												
88	alcesta	ALF	vc	#	ooo	BUI	ooo	—	DIG	kog	KAL	SHH
93	wigginsi	ALF	NR	#	—	ooo	ooo	—	ooo	—	KAL	SHH
MYLOTHRIS												
106	poppea	MEF	NR	#	—	—	—	—	ooo	ooo	ooo	SHH
109	rhodope	ALF	CO	#	BOM	ooo	—	—	ooo	ooo	kal	SHH
111	schumanni	MEF	NR	#	—	BUI	—	—	—	—	—	—
LYCAENIDAE												
PENTILA												
142	pauli	DRF	NR	#	—	ooo	—	—	—	—	KAL	—
152	picena	MEF	NR	#	—	—	—	—	—	—	KAL	—
MIMERESIA												
184	libentina	ALF	CO	#	—	bui	—	—	dig	kog	KAL	—
CITRINOPHILA												
200	similis	MEF	CO	#	—	bui	—	—	dig	—	KAL	—
LARINOPODA												
264	aspidos	MEF	NR	#	—	—	—	—	—	—	KAL	—
OXYLIDES												
356	faunus	MEF	CO	#	—	—	—	—	ooo	—	KAL	—
IOLAUS												
436	iasis	ALF	NR	#	—	bui	—	—	dig	kog	kal	SHH
HYPOLYCAENA												
449	scintillans	ALF	CO	#	—	bui	—	—	dig	—	KAL	—
450	dubia	ALF	CO	#	—	bui	—	—	dig	—	KAL	—
HYPOMYRINA												
492	nomion	DRF	NR	#	BOM	bui	MOL	ooo	DIG	kog	kal	SHH
ANTHENE												
510	sylvanus	ALF	CO	#	—	ooo	—	—	—	—	KAL	—
523	larydas	ALF	CO	#	BOM	bui	MOL	ooo	ooo	kog	KAL	ooo
TRICLEMA												
549	lamias	ALF	NR	#	BOM	—	—	—	—	kog	kal	—

THERMONIPHAS												
617	micylus	MEF	CO	#	bom	bui	—	—	—	—	KAL	—
OBORONIA												
622	punctatus	MEF	CO	#	BOM	—	—	—	dig	—	kal	—
626	ornata	ALF	CO	#	ooo	—	—	—	—	—	KAL	—
AZANUS												
632	isis	ALF	CO	#	BOM	bui	—	—	dig	—	kal	—
NYMPHALIDAE												
LIBYTHEA												
646	labdaca	ALF	CO	#	BOM	bui	—	—	—	—	ooo	—
AMAURIS												
651	tartarea	ALF	NR	#	—	bui	—	—	dig	kog	kal	SHH
653	damocles	DRF	CO	#	ooo	BUI	ooo	ooo	DIG	KOG	KAL	shh
GNOPHODES												
657	chelys	ALF	CO	#	—	BUI	—	—	dig	ooo	kal	—
BICYCLUS												
672	italus	WEF	NR	#	—	—	—	—	—	—	KAL	—
690	vulgaris	ALF	VC	#	—	BUI	MOL	GBE	DIG	kog	KAL	shh
692	sandace	ALF	VC	#	BOM	ooo	—	—	dig	KOG	KAL	—
702	funebris	DRF	CO	#	BOM	BUI	MOL	GBE	dig	KOG	kal	shh
709	martius	MEF	CO	#	—	bui	—	—	ooo	—	KAL	—
YPTHIMA												
717	antennata	ALF	NR	#	ooo	BUI	MOL	GBE	ooo	kog	KAL	shh
719	doleta	ALF	VC	#	BOM	ooo	ooo	ooo	dig	KOG	KAL	ooo
CHARAXES												
729	protoclea	ALF	CO	#	ooo	bui	—	—	dig	kog	KAL	SHH
736	castor	DRF	NR	#	—	bui	MOL	gbe	dig	KOG	ooo	SHH
737	brutus	MEF	CO	#	bom	bui	MOL	ooo	dig	KOG	kal	SHH
741	tiridates	ALF	CO	#	BOM	BUI	MOL	—	dig	kog	ooo	SHH
743	numenes	ALF	NR	#	bom	—	—	—	dig	—	—	SHH
760	etheocles	ALF	CO	#	BOM	bui	MOL	—	dig	ooo	KAL	SHH
768	cedreatis	MEF	NR	#	—	—	—	—	dig	—	kal	SHH
EUXANTHE												
780	eurinome	MEF	NR	#	—	ooo	—	—	—	—	—	SHH
HYPOLIMNAS												
802	anthedon	ALF	CO	#	BOM	BUI	ooo	—	ooo	KOG	kal	ooo
806	salmacis	MEF	CO	#	BOM	bui	—	—	—	KOG	—	—
PROTOGONIOMORPHA												
809	cytora	MEF	NR	#	BOM	bui	—	—	—	ooo	—	—
JUNONIA												
820	stygia	ALF	CO	#	—	BUI	—	—	—	—	ooo	—
823	terea	ALF	VC	#	bom	BUI	MOL	ooo	DIG	KOG	KAL	SHH
CYRESTIS												
825	camillus	ALF	CO	#	—	BUI	—	—	—	—	—	—
ARIADNE												
829	enotrea	ALF	VC	#	BOM	bui	—	—	dig	kog	kal	—
830	albifascia	ALF	NR	#	—	—	—	—	—	—	KAL	—
CYMOTHOE												
863	caenis	ALF	CO	#	BOM	BUI	—	—	dig	KOG	kal	—
PSEUDACRAEA												
880	eurytus	ALF	CO	#	—	BUI	—	—	dig	KOG	KAL	—
884	boisduvalii	DRF	NR	#	—	BUI	—	—	—	—	—	—
887	lucretia	ALF	CO	#	ooo	BUI	—	—	dig	KOG	KAL	—
NEPTIS												
903	metella	ALF	CO	#	—	BUI	—	—	—	—	—	—
905	serena	DRF	NR	#	bom	BUI	MOL	gbe	dig	kog	kal	shh
918	nysiades	MEF	NR	#	—	ooo	—	—	—	KOG	—	—
929	nicoteles	MEF	CO	#	—	—	—	—	—	—	KAL	—

934	trigonophora	MEF	NR	#	—	BUI	—	—	—	—	—	—
937	melicerta	MEF	CO	#	BOM	BUI	—	—	—	—	KAL	—
CATUNA												
941	crithea	ALF	VC	#	bom	bui	—	—	—	—	KAL	—
944	angustatum	MEF	CO	#	—	—	—	—	—	—	KAL	—
EURYPHURA												
948	chalcis	ALF	CO	#	—	—	—	—	dig	—	KAL	—
ATERICA												
953	galene	ALF	CO	#	—	BUI	—	—	dig	KOG	KAL	—
EURIPHENE												
987	ampedusa	ALF	NR	#	—	bui	—	—	—	—	KAL	—
BEBEARIA												
1011	cocalia	ALF	CO	#	—	bui	—	—	dig	—	KAL	—
EUPHAEDRA												
1046	medon	ALF	CO	#	BOM	BUI	—	—	dig	kog	KAL	SHH
1059	diffusa	DRF	NR	#	—	bui	—	—	dig	—	KAL	—
1064	cyparissa	DRF	NR	#	—	BUI	MOL	—	—	—	—	—
1066	themis	DRF	NR	#	—	bui	—	—	dig	—	KAL	—
1075	janetta	ALF	CO	#	—	BUI	MOL	—	dig	—	KAL	—
1083	ceres	ALF	CO	#	—	bui	—	—	dig	—	KAL	—
1085	phaethusa	ALF	CO	#	—	bui	—	—	dig	—	KAL	—
1115	edwardsii	ALF	CO	#	—	BUI	—	—	—	—	—	—
1118	harpalyce	ALF	VC	#	—	BUI	—	—	dig	kog	KAL	—
ACRAEA												
1144	circeis	ALF	CO	#	BOM	—	—	—	—	—	—	—
1152	pharsalus	ALF	CO	#	BOM	bui	—	—	dig	ooo	kal	—
1155	alciope	ALF	VC	#	—	ooo	—	—	DIG	kog	KAL	—
1157	jodutta	ALF	CO	#	BOM	—	—	—	—	—	KAL	SHH
1160	acerata	ALF	NR	#	—	BUI	—	—	dig	ooo	KAL	—
1158	lycoa	ALF	CO	#	—	BUI	—	—	DIG	kog	KAL	SHH
1165	bonasia	ALF	CO	#	BOM	bui	—	—	DIG	—	KAL	—
1167	orestia	MEF	RA	#	—	—	—	—	—	—	—	SHH
1176	egina	ALF	CO	#	bom	bui	ooo	ooo	dig	kog	KAL	SHH
1184	quirina	ALF	CO	#	—	BUI	—	—	ooo	KOG	kal	—
1190	umbra	MEF	NR	#	—	ooo	—	—	dig	ooo	KAL	—
1196	epaea	ALF	CO	#	—	BUI	—	—	dig	KOG	KAL	SHH
HESPERIIDAE												
COELIADES												
1203	chalybe	ALF	CO	#	BOM	BUI	—	—	—	—	—	—
1208	pisistratus	ALF	CO	#	—	BUI	—	—	dig	KOG	kal	SHH
1209	hanno	MEF	NR	#	—	BUI	—	—	dig	KOG	—	—
PYRRHOCHALCIA												
1211	iphis	ALF	CO	#	—	bui	—	—	—	—	KAL	SHH
CELAENORRHINUS												
1224	galenus	ALF	CO	#	—	BUI	—	—	dig	—	KAL	—
EAGRIS												
1233	denuba	ALF	CO	#	BOM	bui	—	—	dig	kog	kal	—
TAGIADES												
1232	flesus	ALF	CO	#	bom	BUI	mol	GBE	DIG	kog	KAL	SHH
ERETIS												
1244	melania	DRF	NR	#	bom	BUI	ooo	—	dig	kog	KAL	—
SARANGESA												
1250	thecla	ALF	CO	#	ooo	bui	—	—	dig	kog	KAL	—
SPIALIA												
1269	ploetzi	ALF	NR	#	—	ooo	—	—	dig	ooo	KAL	—
GORGYRA												
1286	mocquerysii	ALF	NR	#	—	ooo	—	—	ooo	ooo	KAL	—
1292	diversata	MEF	NR	#	—	ooo	—	—	kal	ooo	KAL	—

1294	minima	DRF	NR	#	ooo	bui	ooo	—	DIG	KOG	kal	shh
1296	subfacatus	ALF	NR	#	—	ooo	—	—	dig	—	KAL	—
GYROGRA												
1299	subnotata	ALF	NR	#	—	ooo	—	—	dig	ooo	KAL	—
OSMODES												
1325	omar	DRF	NR	#	—	bui	—	—	dig	—	KAL	—
1328	thora	ALF	CO	#	BOM	bui	—	—	dig	—	kal	—
ACLEROS												
1341	ploetzi	ALF	CO	#	ooo	BUI	—	—	—	—	kal	
1342	mackenii	ALF	CO	#	ooo	BUI	—	—	—	—	KAL	—
MEZA												
1354	meza	ALF	VC	#	—	bui	—	—	dig	—	KAL	—
ANDRONYMUS												
1367	caesar	ALF	CO	#	ooo	bui	—	—	dig	KOG	KAL	—
PTEROTEINON												
1387	laufella	ALF	CO	#	—	bui	—	—	dig	—	KAL	—
MONZA												
1416	cretacea	ALF	CO	#	bom	bui	—	—	dig	KOG	KAL	
PLATYLESCHES												
1437	picanini	ALF	NR	#	—	ooo	—	—	dig	KOG	kal	—

APPENDIX 3

THE GUINEA SAVANNAH AND SUDAN SAVANNAH BUTTERFLIES OF GHANA, AS WELL AS A FEW SPECIES OF SPECIAL HABITATS.

LOCALITIES					BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
PAPILIONIDAE												
GRAPHIUM												
20	angolanus	GUI	CO	#	BOM	bui	MOL	GBE	DIG	KOG	KAL	SHH
PIERIDAE												
EUREMA												
43	brigitta	GUI	NR	#	bom	BUI	MOL	GBE	DIG	KOG	KAL	SHH
PINACOPTERYX												
44	eriphia	SUD	NR	~	—	—	—	gbe	—	—	—	—
COLOTIS												
54	vesta	SUD	NR	~	—	—	mol	gbe	—	—	—	—
57	celimene	SUD	RA	~	—	—	ooo	ooo	—	—	—	—
58	ione	SUD	NR	~	—	—	ooo	gbe	—	—	—	—
60	danae	SUD	NR	~	—	—	mol	gbe	—	—	—	—
61	aurora	SUD	NR	#	—	—	mol	GBE	—	ooo	—	ooo
62	antevippe	SUD	NR	#	—	ooo	mol	gbe	ooo	KOG	ooo	SHH
65	evagore	SUD	CO	#	bom	BUI	MOL	gbe	ooo	ooo	ooo	SHH
BELENOIS												
68	aurota	SUD	CO	#	bom	bui	mol	gbe	dig	kog	kal	shh
69	creona	SUD	VC	#	bom	BUI	mol	GBE	dig	kog	kal	SHH
70	gidica	SUD	NR	#	—	—	mol	gbe	ooo	—	—	SHH
72	subeida	SUD	NR	#	—	—	MOL	gbe	—	—	—	—
DIXEIA												
78	doxo	SUD	NR	~	—	—	ooo	gbe	—	—	—	—
79	orbona	SUD	NR	~	—	—	mol	gbe	—	—	—	—
LYCAENIDAE												
MYRINA												
354	silenus	GUI	NR	#	bom	bui	mol	gbe	dig	kog	kal	SHH
355	subornata	GUI	RA	~	—	—	mol	gbe	—	—	—	shh
APHARITIS												
368	nilus	SUD	RA	~	—	—	mol	gbe	—	—	—	shh
SPINDASIS												
369	mozambica	GUI	NR	#	bom	bui	mol	gbe	dig	kog	kal	SHH
370	avriko	GUI	RA	#	ooo	—	ooo	ooo	ooo	—	ooo	ooo
ZERITIS												
374	neriene	SUD	NR	#	ooo	ooo	mol	ooo	ooo	ooo	ooo	ooo
AXIOCERSES												
375	harpax	GUI	NR	#	bom	bui	mol	GBG	dig	kog	KAL	SHH
377	amanga	SUD	RA	#	—	ooo	mol	GBE	—	—	—	ooo
LIPAPHNAEUS												
379	aderna	GUI	NR	#	—	ooo	—	—	—	—	—	—
IOLAUS												
393	menas	SUD	NR	~	ooo	—	mol	gbe	ooo	ooo	ooo	ooo
398	ismenias	SUD	NR	#	bom	bui	mol	GBE	dig	kog	kal	shh
411	alienus	SUD	RA	~	—	—	mol	gbe	—	—	—	—
414	scintillans	SUD	NR	~	bom	bui	mol	gbe	ooo	—	—	ooo
STUGETA												
441	marmoreus	SUD	NR	~	bom	bui	mol	gbe	dig	kog	ooo	shh

HYPOLYCAENA												
443	philippus	GUI	CO	#	bom	bui	MOL	GBE	dig	KOG	KAL	shh
PILODEUDORIX												
460	caerulea	GUI	NR	#	bom	bui	mol	gbe	dig	kog	kal	shh
DEUDORIX												
494	antalus	GUI	CO	#	bom	bui	MOL	gbe	dig	KOG	KAL	SHH
495	livia	SUD	VR	~	—	—	mol	gbe	—	—	—	ooo
498	dinochares	GUI	RA	#	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo
ANTHENE												
513	definita	GUI	NR	#	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo
514	princeps	GUI	NR	#	bom	bui	ooo	ooo	dig	kog	kal	ooo
515	starki	GUI	RA	#	—	BUI	—	—	ooo	ooo	ooo	ooo
516	amarah	SUD	NR	#	bom	bui	mol	GBE	dig	kog	KAL	shh
517	lunulata	GUI	CO	#	bom	bui	mol	gbe	DIG	KOG	kal	shh
518	kikuyu	GUI	RA	~	bom	ooo	mol	gbe	ooo	ooo	ooo	shh
519	talboti	SUD	VR	#	—	—	MOL	gbe	—	—	—	ooo
520	wilsoni	GUI	RA	~	—	—	—	—	—	—	—	—
524	crawshayi	GUI	NR	#	bom	BUI	MOL	gbe	dig	kog	KAL	shh
556	nigeriae	GUI	NR	#	bom	ooo	mol	gbe	dig	ooo	kal	shh
PSEUDONACADUBA												
565	sichela	GUI	CO	#	bom	BUI	MOL	GBE	DIG	KOG	kal	shh
LEPTOTES												
579	babaulti	GUI	NR	#	bom	bui	mol	gbe	dig	kog	kal	shh
581	brevidentatus	GUI	NR	#	bom	bui	mol	gbe	dig	kog	kal	SHH
TUXENTIUS												
583	cretosus	SUD	CO	#	—	BUI	MOL	GBE	ooo	ooo	—	ooo
TARUCUS												
586	ungemachi	SUD	NR	#	—	—	MOL	GBE	—	—	—	shh
588	rosacea	SUD	RA	#	—	—	MOL	gbe	—	—	—	—
ACTIZERA												
592	lucida	GUI	EA	~	—	—	—	—	—	—	—	—
EICOCHRYSOPS												
593	hippocrates	SPE	CO	#	BOM	bui	MOL	gbe	dig	KOG	kal	SHH
594	dudgeoni	GUI	NR	#	bom	bui	MOL	gbe	dig	kog	kal	ooo
CUPIDOPSIS												
595	jobates	SUD	RA	~	ooo	—	ooo	gbe	ooo	ooo	ooo	ooo
596	cissus	GUI	NR	#	bom	bui	MOL	GBG	dig	KOG	kal	shh
EUCHRYSOPS												
598	albistriata	GUI	NR	#	bom	bui	mol	gbe	dig	KOG	KAL	shh
600	reducta	SUD	NR	#	ooo	ooo	MOL	GBE	ooo	ooo	ooo	ooo
604	osiris	GUI	CO	#	BOM	bui	mol	gbe	dig	KOG	KAL	SHH
605	barkeri	GUI	NR	#	bom	ooo	ooo	ooo	ooo	ooo	kal	ooo
606	sahelianus	SUD	NR	#	—	—	MOL	GBE	dig	ooo	ooo	ooo
LEPIDOCHRYSOPS												
607	victoriae	GUI	RA	#	ooo	ooo	mol	gbe	ooo	ooo	ooo	shh
608	parsimon	GUI	RA	#	ooo	bui	ooo	—	—	—	—	—
611	synchrematiza	GUI	RA	~	ooo	ooo	mol	—	—	—	—	—
615	quassi	GUI	NR	~	ooo	ooo	—	—	—	—	—	—
AZANUS												
627	ubaldus	SUD	RA	~	—	—	mol	gbe	—	—	—	—
628	jesous	SUD	RA	#	—	—	MOL	GBE	—	—	—	shh
629	moriqua	SUD	NR	#	—	BUI	MOL	gbe	—	KOG	—	—
631	natalensis	GUI	RA	#	—	ooo	mol	GBG	—	—	KAL	—
CHILADES												
633	eleusis	SUD	RA	~	—	—	ooo	gbe	—	—	—	—
634	trochylus	GUI	NR	#	ooo	ooo	mol	ooo	DIG	KOG	ooo	SHH
ZIZINA												
636	antanossa	GUI	NR	#	bom	bui	mol	gbe	DIG	kog	kal	shh

NYMPHALIDAE

TIRUMALA												
648	petiverana	GUI	CO	#	bom	BUI	mol	GBE	dig	KOG	kal	SHH
AMAURIS												
650	niavius	GUI	CO	#	BOM	BUI	mol	ooo	DIG	KOG	KAL	shh
BICYCLUS												
679	pavonis	GUI	CO	#	bom	BUI	MOL	GBE	—	—	—	—
680	milyas	GUI	NR	#	ooo	bui	MOL	gbe	—	—	—	—
697	campa	GUI	NR	#	—	—	mol	GBE	dig	kog	ooo	—
698	angulosa	GUI	CO	#	bom	BUI	—	—	DIG	KOG	KAL	shh
701	safitza	GUI	NR	#	BOM	bui	mol	gbe	DIG	kog	KAL	SHH
YPTHIMA												
715	asterope	SUD	RA	~	—	—	mol	gbe	—	—	—	ooo
716	condamini	GUI	CO	#	bom	—	MOL	gbe	DIG	ooo	ooo	SHH
718	vuattouxi	GUI	NR	#	bom	BUI	MOL	gbe	ooo	KOG	kal	ooo
721	pupillaris	GUI	NR	#	—	bui	MOL	ooo	DIG	KOG	KAL	ooo
722	impura	GUI	RA	#	—	bui	MOL	ooo	ooo	KOG	ooo	ooo
YPTHIMOMORPHA												
724	itonia	SPE	NR	#	bom	bui	MOL	GBE	DIG	KOG	KAL	ooo
CHARAXES												
725	varanes	GUI	CO	#	bom	BUI	MOL	gbe	DIG	KOG	kal	SHH
733	lactetinctus	GUI	RA	#	bom	ooo	ooo	ooo	ooo	KOG	ooo	ooo
734	epijasius	GUI	CO	#	bom	BUI	MOL	GBE	DIG	KOG	kal	SHH
755	achaemenes	GUI	CO	#	BOM	BUI	MOL	GBE	DIG	KOG	kal	SHH
770	viola	SUD	CO	#	bom	BUI	MOL	GBE	DIG	ooo	kal	ooo
771	northcotti	GUI	RA	#	bom	—	MOL	ooo	ooo	ooo	—	ooo
PRECIS												
792	octavia	GUI	NR	#	bom	BUI	mol	GBE	dig	kog	KAL	shh
793	antilope	GUI	NR	#	bom	bui	MOL	GBE	dig	kog	kal	shh
796	ceryne	SPE	NR	#	—	ooo	—	—	—	ooo	—	—
JUNONIA												
813	orithya	SUD	CO	#	ooo	ooo	MOL	GBE	ooo	kog	ooo	SHH
815	hierta	SUD	CO	#	bom	ooo	MOL	GBE	DIG	KOG	ooo	SHH
822	chorimene	GUI	CO	#	bom	BUI	MOL	GBE	DIG	kog	kal	SHH
CATACROPTERA												
824	cloanthe	GUI	NR	#	bom	BUI	mol	gbe	dig	KOG	KAL	shh
BYBLIA												
827	ilithyia	SUD	RA	~	—	—	mol	gbe	—	—	—	—
NEPTIS												
906	kiriakoffi	GUI	NR	#	bom	BUI	MOL	GBE	dig	kog	kal	SHH
907	morosa	GUI	CO	#	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
HAMANUMIDA												
951	daedalus	GUI	CO	#	BOM	BUI	MOL	GBE	DIG	KOG	KAL	SHH
ACRAEA												
1179	caecilia	SUD	CO	#	bom	BUI	MOL	GBE	dig	kog	kal	ooo

HESPERIIDAE

COLIADINAE

PYRRHIADES												
1210	lucagus	DRF	CO	#	BOM	—	—	—	—	—	—	SHH
ERETIS												
1242	lugens	GUI	CO	#	bom	bui	MOL	GBG	dig	ooo	ooo	ooo
SARANGESA												
1245	laelius	GUI	NR	#	bom	BUI	MOL	GBG	DIG	KOG	shh	—
1246	phidyle	SUD	NR	~	—	—	ooo	gbe	—	—	—	—
CAPRONA												
1253	adelica	GUI	RA	#	bom	bui	mol	ooo	DIG	KOG	kal	shh
1254	pillaana	SUD	VR	#	—	—	ooo	GBE	—	—	—	shh
NETROBALANE												

1255	canopus	GUI	RA	~	—	—	—	—	—	—	—	shh
ABANTIS												
1256	bismarcki	GUI	RA	#	—	—	—	—	dig	—	ooo	—
1258	nigeriana	GUI	NR	#	—	bui	mol	GBE	dig	ooo	kal	SHH
1259	pseudonigeriana	SUD	RA	#	bom	—	—	gbe	—	—	kal	—
SPIALIA												
1265	spio	SUD	CO	#	bom	bui	mol	gbe	dig	KOG	kal	shh
1267	diomus	SUD	NR	#	bom	bui	mol	gbe	dig	kog	kal	shh
1268	dromus	GUI	NR	#	bom	bui	MOL	gbe	dig	kog	kal	shh
ASTICTOPTERUS												
1277	abjecta	GUI	CO	#	bom	bui	mol	ooo	DIG	KOG	KAL	ooo
KEDESTES												
1282	protensa	GUI	VR	#	—	—	MOL	gbe	ooo	—	—	—
PARDALEODES												
1311	incerta	GUI	CO	#	bom	BUI	—	—	dig	KOG	KAL	SHH
PAROSMODES												
1320	morantii	SUD	RA	#	—	—	mol	gbe	—	—	—	SHH
PLATYLESCHES												
1434	moritili	GUI	NR	#	bom	bui	MOL	gbe	dig	kog	kal	shh
1439	affinissima	GUI	NR	~	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo
1440	chamaeleon	GUI	NR	~	ooo	ooo	mol	ooo	ooo	ooo	ooo	ooo
1441	batangae	GUI	RA	~	—	—	ooo	ooo	—	—	—	ooo
BORBO												
1446	fallax	GUI	NR	#	bom	bui	MOL	gbe	DIG	kog	kal	SHH
1447	fanta	GUI	NR	#	BOM	bui	mol	ooo	DIG	kog	kal	shh
1448	perobscura	GUI	NR	#	bom	BUI	MOL	GBE	dig	KOG	KAL	SHH
1449	micans	SPE	RA	#	ooo	ooo	mol	—	dig	kog	kal	shh
1450	borbonica	GUI	NR	#	ooo	ooo	mol	gbe	dig	kog	ooo	shh
1451	gemella	GUI	NR	#	bom	bui	MOL	GBE	DIG	kog	kal	shh
1454	holtzi	GUI	NR	#	bom	ooo	mol	gbe	dig	kog	kal	shh
PARNARA												
1456	monasi	GUI	RA	~	ooo	bui	mol	ooo	dig	kog	kal	—
GEGENES												
1457	‘pumilio’	SUD	NR	~	—	—	mol	gbe	ooo	ooo	—	ooo
1459	niso	GUI	NR	#	bom	bui	MOL	gbe	dig	kog	kal	ooo
1460	hottentota	GUI	NR	#	bom	bui	MOL	GBE	DIG	kog	ooo	ooo