

Butterfly Conservation Europe

Survey and Monitoring Report
produced by West Midlands
Butterfly Conservation
and the Hungarian
Lepidopterological Society

Aggtelek National Park

22 – 28 July, 2006



Introduction

Background

The first links between the West Midlands branch of Butterfly Conservation (Europe's largest insect charity based in the UK) and Hungary date back to 2003 when a group from the branch went to Hungary on the first ever butterfly trip organised by Ecotours. Both the abundance and diversity of species recorded during this visit (over 100 species of butterfly and 250+ species of moth) was impressive but there was concern that this fantastic diversity was threatened by the cessation of traditional management practices. A problem which it was feared might be further exacerbated by Hungary's accession to the European Union.

Here things might have rested but the seed of an idea had been sown. The number of active butterfly and moth enthusiasts in Hungary was tiny, there was a lack of appreciation of the importance of Hungary for Lepidoptera in a European context (with many of the butterflies recorded during the first visit being those becoming increasingly scarce or non-existent in western Europe such as the Hungarian Glider and Dusky Large Blue), and, in some cases, there appeared to be little specific habitat management for invertebrates taking place. Was there a way that Butterfly Conservation in the UK could play a role? How relevant was butterfly conservation in Hungary to what was happening in the UK? It seemed that the furthering of links between Butterfly Conservation in the UK and other parts of Europe could be justified on many levels. We had already begun to see the fruition of a developing partnership between Dutch Butterfly Conservation and our national office which had led to a sharing of expertise and knowledge and the first joint publication. It was clear that a number of species threatened in the UK were still relatively common in continental Europe and perhaps the encouragement of further studies abroad could assist us in our own conservation efforts at home. For all these good reasons, there had been increasing support for the idea of Butterfly Conservation taking a more European wide perspective. This support finally culminated in the establishment of Butterfly Conservation Europe in 2005.

Meanwhile, the West Midlands branch of Butterfly Conservation had maintained links with Ecotours and it now seemed a good time to take this partnership a stage further by developing a joint conservation project in Hungary. During the summer of 2005, Simon Barker, John Reeve and Mike Williams representing the West Midlands branch visited Hungary to identify a suitable project. They were again assisted by Ecotours and introduced to various people including Szabolcs Safian from the newly formed Hungarian Lepidopterists Society and staff of the Aggtelek NP including the Director, Salamon Gabor. The idea of a group of volunteers from the UK visiting the national park to undertake work on butterflies was well received and it was agreed that a project would be developed with the support of the national park to take place in the summer of 2006. The project received the backing of Dr. Martin Warren, Chief Executive of Butterfly Conservation UK, and became the first transnational project to be undertaken under the auspices of Butterfly Conservation Europe. Eleven volunteers were subsequently recruited to work in the Aggtelek National Park during the period 22-28th July, 2006.

Project Proposal

The aim of the project was to undertake general survey work in the buffer zone of the Aggtelek NP to identify the range of butterflies present in habitats which are partly managed by the Hungarian Bird Society (see map of survey area in Appendix 1). As well as providing information on species present, an attempt would be made to assess butterfly abundance and diversity in different habitat zones. Of particular interest was to assess the impact of burning on butterfly populations. This method of management had been increasingly used in recent years because of the absence of grazing animals but no monitoring had taken place. The group were accommodated in the village of Gomorszolos just outside the national park boundary. As well as surveying butterfly populations, a mercury vapour light was run each night at the accommodation to record moths. Day flying moths were also noted and the more interesting species are mentioned in the text. A list of those moths recorded at light are contained in Appendix 2 and a full list of butterflies recorded at Appendix 3. At the request of the National Park, an additional half a day was spent undertaking a survey of the Latrany Valley (see Appendix 4) where no previous Lepidoptera records existed.

Methods

In the main survey area (Site A), a series of timed transects were walked (either one or two hours) covering the different habitat types. Transects are a quick method of assessing the abundance of butterflies. They consist of walking a set route in ideal weather conditions (i.e. when butterflies are in flight and therefore easily seen) and counting the total number of each species recorded during a set time period. Broadly, each valley investigated was split into three sections: the valley floor, the top of the valley and a mid section roughly halfway between the other two. Transects were carried out in each of these sections by 3-4 recorders who noted every butterfly seen within a 5m corridor (the standard width for transect recording). At the end of each section butterflies were placed into an abundance category: A = 1 adult, B = 2-9 adults, C = 10-30 adults, D = 31 – 100 adults, E = 100+ adults. GPS readings were taken at the start and end of each transect so that they might be located on a map and could be revisited at a later date if required. The main vegetation type was also noted for each transect route which frequently consisted of several sub-sections (each sub-section representing a discrete habitat type i.e. burnt, boggy etc).

At Site B, with less time available, no timed transects were attempted. Instead, volunteers tried to cover as much of the site as possible and produce a comprehensive list of all species present.

Results and Discussion

Site Descriptions

Gömörszőlős - Szuhafő

The sites A (Gömörszőlős) and B (Szuhafő, Latrányi Valley) are found in the Putnok Hills which is situated in north-east Hungary, right at the south-western edge of Aggtelek-Slovak Karst. The area itself is a buffer zone for the Aggtelek National Park in Hungary, but there is a demand from the National Park Directorate to include the area in a future extension. There is also a high demand for data on the fauna of the Putnok Hills including butterflies and it was therefore selected as a site for our survey.

Site A (Gömörszőlős, Pozsok Valley)

The majority of the area consists of grassy hills in heterogeneous condition, because some parts were traditionally managed either as hayfield or grazed by cattle, sheep and horses. These lands mostly remain in semi-natural condition and conservation management is necessary to maintain these habitats to prevent their reversion to scrub. Other parts were recently used as arable fields but they appear to have been abandoned for at least 10 years. The bottom of the Pozsok Valley can be described as wetland, mostly tall-herb arundinaceous vegetation with patches of sallow and willow shrub. Along the tracks, inside the surveyed area, is disturbed, ruderal vegetation.



Site B (Szuhaľő, Latrány Valley)

The area is an open valley with extensive grassland surrounded by woodland. The bottom of the valley is mainly marshland with extensive arundinaceous vegetation and willow scrub. The surrounding grasslands are mezophilous meadows rich in herbs with xerothermic short grass vegetation on the top of the hills. The surrounding forest is partly Scots Pine plantations and Turkey Oak woodland, but there are some clusters of sub-mediterranean Pubescent Oak on the driest hilltops. Most habitats are in fairly good condition except the planted Scots Pine woodland and the roadside verges which were fringed by ruderal vegetation. Some parts of the grassland were overgrown by Blackthorn scrub.



Results

SITE A

The Pozsok Valley around Gömörszőlős is an ideal site for comparison of butterfly communities in different and/or differently managed habitats. While the floor of the valley was a marshy area, the hilltops were extremely dry and warm. During the transect walks, we were able to monitor not only the density and diversity of the butterfly species, but the changes of the composition of the butterfly communities between different habitats.

During the survey an impressive 61 species of butterflies were observed. The full list can be read in Appendix 3. While most species recorded are generally common and widespread, some are restricted to certain habitats and have specific ecological requirements. These can be considered as indicator species, whose presence, absence or density can rank the quality of the habitats. In the surveyed area, species were associated with the following habitats: wet meadow – **Large Copper**, **Nickerl's Fritillary**, mezophilous meadow – **Assmann's Fritillary**, **Large Blue**, **Idas Blue**, xerothermic hilltops – **Osiris Blue**, **Anomalous Blue**, disturbed habitats – **Marbled white**, **Dryad**.

The most common species in all habitat types are the ones which are non habitat specialists.

Three species of butterfly were recorded in very high numbers: **Ringlet**, **Marbled White**, and **Meadow Brown** (>1000 of each species).

For the rarest species only one specimen was caught, either because the density was very low (e.g. **Large Blue**) or it was caught at the very end or the beginning of their flight season (e.g. **Green Hairstreak**, **Twin-spot Fritillary**, **Marbled Fritillary**).

From the 60 recorded species, 11 have conservation importance in Hungary (**Swallowtail**, **Scarce Swallowtail**, **Osiris Blue**, **Idas Blue**, **Anomalous Blue**, **Lesser Purple Emperor**, **Common Glider**, **Peacock**, **Red Admiral**, **Small Tortoiseshell**, **Lesser Marbled Fritillary**), while 2 species are included in the Habitats Directive (NATURA 2000) of the EEC (**Large Copper**, **Large Blue**).

SITE B

In the Latrány Valley, a comprehensive butterfly survey was carried out and 63 species were recorded which is more than one-third of the Hungarian butterfly fauna. The butterfly fauna of Latrány Valley is very diverse, which could easily reach to over 100 species. We found lots of special and rare species, which deserve formal protection under the authority of the Aggtelek National Park.

The following species have conservation importance in Hungary:

Large Blue is listed on the Annex IV of the Habitats Directive of the EC as a species which needs strict protection in the European Union:

Large Blue – *Maculinea arion*: according to the most recent surveys, the species has two morphologically and ecologically well defined races in Europe of which both occur in Hungary. Sometimes they share habitats, but there is a clear phonological isolation between the subspecies. The nominate one normally flies from late April to early June, while the *M. arion* ssp. *ligurica* is on the wing from late June or early July to early August. The larvae of the latter feeds on *Origanum vulgare*, which was found fairly commonly in the whole valley. Several imagos were seen on the wing in practically all parts of the valley, but it is worth noting that the species requires a large and diverse landscape because it is a highly active species which easily flies some kilometres to find foodplants or nectar sources.

A number of other butterflies were recorded with high conservation or bio-geographical importance:

Lesser Marbled Fritillary – *Brenthis ino*:

This species requires humid or mesophilous meadows where its foodplant (*Filipendula* spp.) occurs. It is reported as being widespread and locally common in the neighbouring Aggtelek Karst but, as it flies earlier in the year, only a very worn female specimen was recorded.

Lesser Purple Emperor - *Apatura ilia*:

This is a typical humid forest-edge, riverine forest and sallow-willow bog species, which can be locally abundant. One male and one female were observed in the humid part of the valley, perching on willow leaves.

Pallas' Fritillary – *Argynnis laodice*:

The species is part of a Siberian element in the Hungarian fauna, which just reaches the inner part of the Carpathian Basin, from Ukraine and Eastern Slovakia. It occurs only in the Zemplén Mountains and the Bükk Mountains and the surrounding hills in Hungary. During a population explosion it reached Aggtelek Karst, but it seems to be rare in the area. Only one specimen was observed in the Latrány Valley. It is an important member of the Hungarian fauna which deserves protection.

Small Pearl-bordered Fritillary – *Boloria (Clossiana) selene*:

The species is somewhat widespread and can be locally abundant in some parts of Hungary. It requires large, wetter flowery meadows where the imagos can nectar. One of the firstly emerged specimens of the second brood was recorded.

Anomalous Blue – *Polyommatus (Agriodetus) admetus*:

This species is considered to be one of the most important members of the Hungarian butterfly fauna. It has a Pontomediterranean distribution, and it just penetrates the Carpathian Basin. In Hungary it is restricted to some parts of the northern sub-mountainous and hilly region, where it inhabits extreme dry and warm slopes and hilltops wherever their foodplant, *Onobrychis viciaefolia* occurs. It can be locally common, but even small changes in the habitat can cause it to disappear.

Osiris blue – *Cupido osiris*:

The species occurs and shares its larval foodplant with the Anomalous Blue. Only one female was found.

Dusky Meadow Brown – *Hyponephele lycaon*:

One of the most important species recorded in the valley. This butterfly has a very patchy distribution in Hungary, restricted to dry habitats in good condition. A strong population exists in this valley inhabiting the driest grasslands of the hills along the forest edge.

Other protected species recorded were:

Swallowtail – *Papilio machaon*

Scarce Swallowtail – *Iphiclides podalirius*

A number of other important butterflies which possibly occur in the valley but which were not recorded at the time of survey were:

Large Copper – *Lycaena dispar*:

Usually recorded in large marshy areas which are in good condition. As it was recorded around Gömörszőlös, it is very likely to also be present in this valley.

Geranium Argus – *Aricia eumedon*:

The species is restricted to its foodplant (*Geranium* spp., mostly *Geranium palustre*, *G. sylvaticum*, *G. pratense*). Only relatively few colonies are known from Hungary, but probably there are more to be found associated with *Geranium*. In the most humid part of the valley a good population of *G. palustre* was found so the butterfly is likely to be present earlier in the season.

The full list of the recorded butterfly species is given in Appendix 4.

Moth records

During the whole project moth trapping was carried out at the accommodation with a 160 W mixed light. The light trapping was resulted in more than 140 macro moth species, which is a high number in such a short recording period. Other day-flying moths were recorded during the transect walk. The full list of the species are presented in the Appendix 2.

Recommendations

1. The re-establishment of a conservation grazing programme in the Aggtelek National Park area is urgently required to prevent further encroachment of scrub and to maintain the diversity of habitats for Lepidoptera and other wildlife. Grazing priority to be given to valley floors particularly where important species like *Lycaena dispar* (Large Copper) are present.
2. To designate areas of protection for specific butterflies such as the Large Copper and *Maculinia* spp.
3. To set up a long term monitoring programme. This should include vegetation monitoring on a number of sites such as Site A by establishing of a series of quadrats in different areas which correspond to changing habitat conditions e.g. burnt and unburnt land. Monitoring could also take the form of fixed point photography to maintain a visual record of any habitat changes.
4. To carry out further survey work on both butterflies and moths. This should be focussed on a) areas where key species have already been recorded b) areas which are unrecorded and c) areas which are subject to different forms of management.
5. To include the Latrany Valley as part of the Aggtelek National Park as a matter of priority.
6. To seek Hungarian and/or international (EU) funds and other financial sources for both the monitoring and management of these important areas.
8. To organise training for National Park employees in both the recognition of the importance of Lepidoptera in conservation and to provide information on the butterfly species and their habitat requirements.
9. For the above mentioned aims and objectives, a longer term partnership is recommended between the Aggtelek National Park, national NGOs (e.g. Hungarian Lepidopterological Society and Butterfly Conservation Europe) to develop opportunities for further funding.

Conclusions

The Aggtelek National Park supports a very rich assemblage of Lepidoptera with a number of internationally and nationally important species. This was demonstrated by the large diversity of species recorded in a very short time period. There is huge scope for further recording in this area.

On Site A over 60 butterfly species were recorded and some of the commoner species were present in numbers no longer observed in Britain.

On Site B, more species were recorded in a single morning than can be seen in Britain in a whole year.

At the Gomorszolos Research Centre, at least 140 macro-moths were recorded over four nights again illustrating the amazing Lepidoptera diversity.

There is no doubt that the Aggtelek National Park area is of huge international importance for its Lepidoptera and its conservation should be a very high priority.

Acknowledgements

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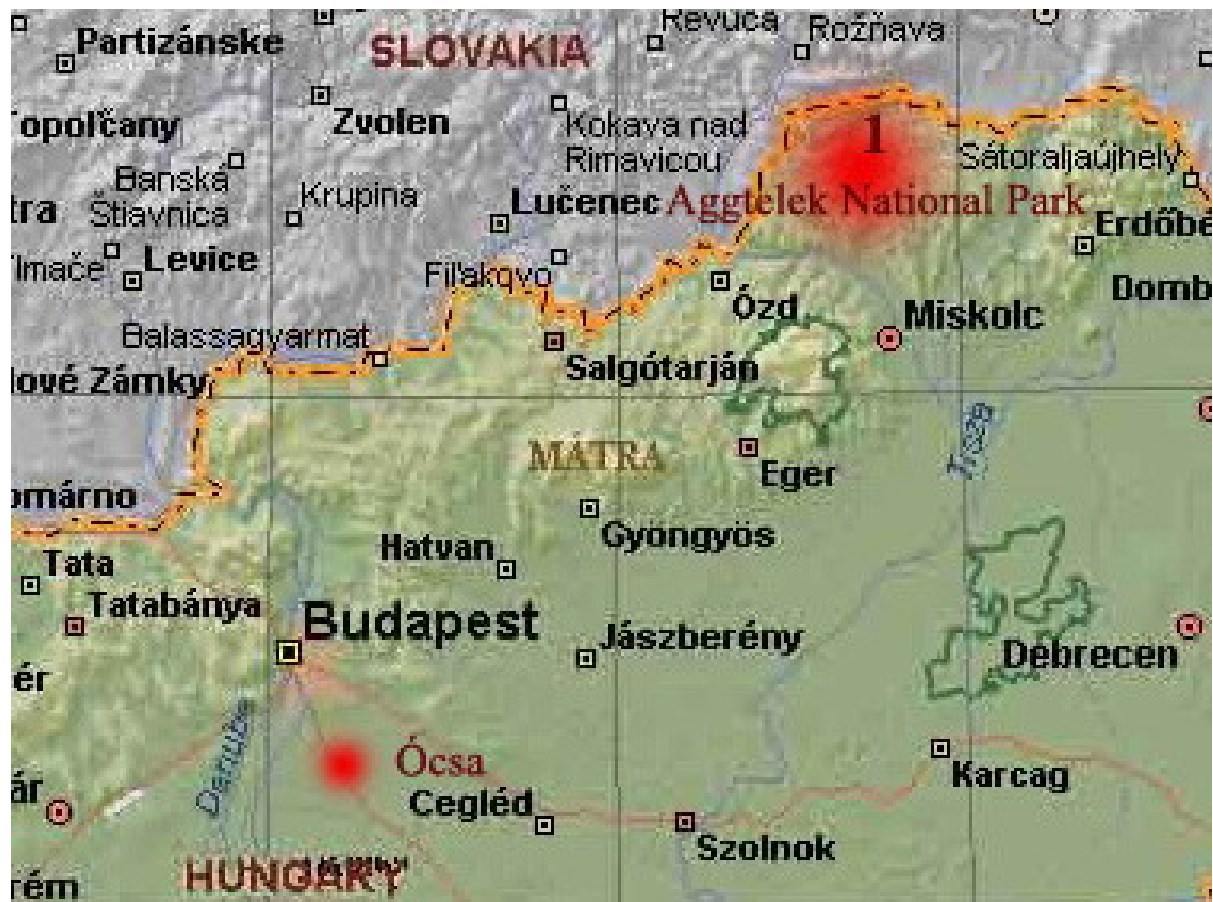


Dr. Ian Duncan
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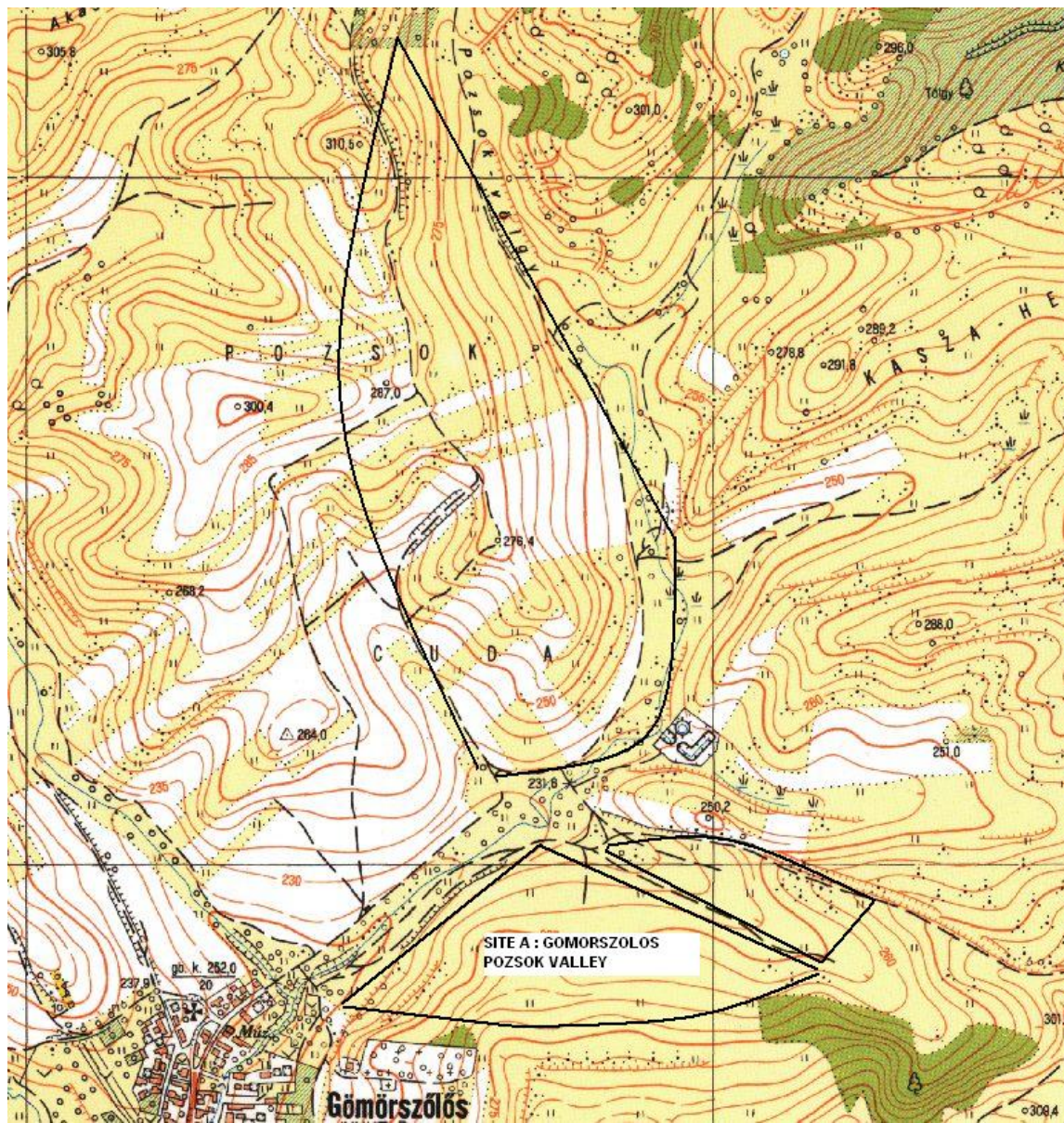
July 2006

Appendix 1: Map of Survey areas

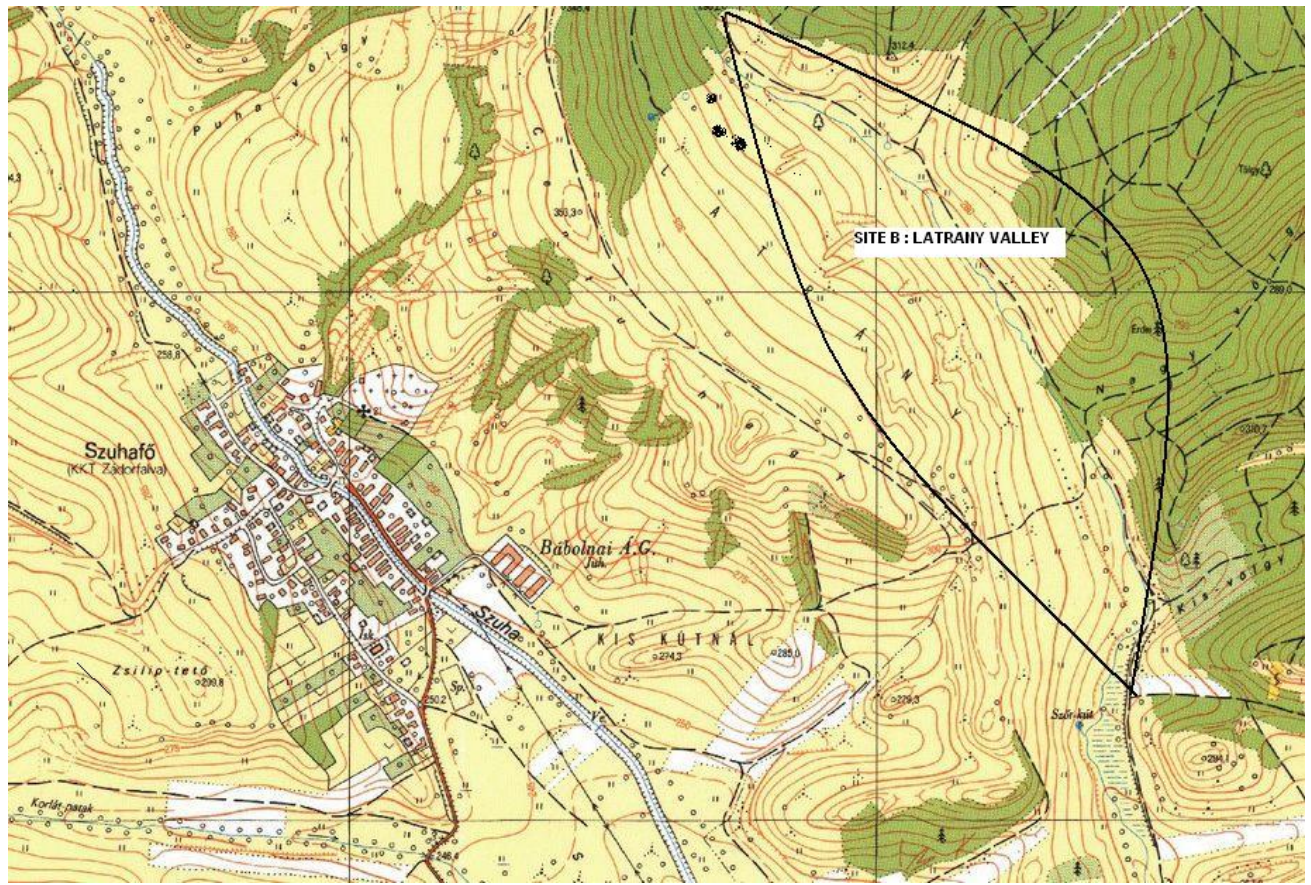
Location of Aggtelek National Park within Hungary



Location of Site A near Gomorszólós



Location of Site B near Szuhafo



Appendix 2

Macro moths recorded on 160W HMLI light trap at Gomorszolos Research Centre
22-26. July 2006.

FAMILY	GENUS	SPECIES	ENGLISH NAME
<i>Lasiocampidae</i>	Malacosoma	<i>neustria</i>	Lackey
<i>Lasiocampidae</i>	Odonestis	<i>pruni</i>	
<i>Lasiocampidae</i>	Gastropacha	<i>quercifolia</i>	Lappet
<i>Sphingidae</i>	Sphinx	<i>ligustri</i>	Privet Hawkmoth
<i>Sphingidae</i>	Hyloicus	<i>pinastri</i>	Pine Hawkmoth
<i>Sphingidae</i>	Smerinthus	<i>ocellata</i>	Eyed Hawkmoth
<i>Sphingidae</i>	Deilephila	<i>porcellus</i>	Small Elephant Hawkmoth
<i>Drepanidae</i>	Sabra	<i>harpagula</i>	Scarce Hook-tip
<i>Geometridae</i>	Scotopteryx	<i>bipunctaria</i>	Chalk Carpet
<i>Geometridae</i>	Xanthorhoe	<i>ferrugata</i>	Dark-barred Twin-spot Carpet
<i>Drepanidae</i>	Drepana	<i>curvatula</i>	Dusky Hook-tip
<i>Drepanidae</i>	Drepana	<i>falcataria</i>	Pebble Hook-tip
<i>Drepanidae</i>	Thyatira	<i>batis</i>	Peach Blossom
<i>Drepanidae</i>	Habrosyne	<i>pyritoides</i>	Buff Arches
<i>Drepanidae</i>	Tethea	<i>or</i>	Poplar Lutestring
<i>Geometridae</i>	Pseudoterpna	<i>pruinata</i>	Grass Emerald
<i>Geometridae</i>	Geometra	<i>papilionaria</i>	Large Emerald
<i>Geometridae</i>	Chlorissa	<i>viridata</i>	Small Grass Emerald
<i>Geometridae</i>	Thalera	<i>fimbrialis</i>	Sussex Emerald
<i>Geometridae</i>	Hemistola	<i>chrysoprasaria</i>	Small Emerald
<i>Geometridae</i>	Cyclophora	<i>annularia</i>	Mocha
<i>Geometridae</i>	Timandra	<i>comae</i>	Blood-vein
<i>Geometridae</i>	Scopula	<i>immorata</i>	Lewes Wave
<i>Geometridae</i>	Scopula	<i>nigropunctata</i>	Sub-angled Wave
<i>Geometridae</i>	Idaea	<i>muricata</i>	Purple-bordered Gold
<i>Geometridae</i>	Scotopteryx	<i>chenopodiata</i>	Shaded Broad-bar
<i>Geometridae</i>	Xanthorhoe	<i>spadicearia</i>	Red Twin-spot Carpet
<i>Geometridae</i>	Xanthorhoe	<i>quadrifasciata</i>	Large Twin-spot Carpet
<i>Geometridae</i>	Catarhoe	<i>cuculata</i>	Royal Mantle
<i>Geometridae</i>	Epirrhoe	<i>alternata</i>	Common Carpet
<i>Geometridae</i>	Pelurga	<i>comitata</i>	Dark Spinach
<i>Geometridae</i>	Ecliptopera	<i>silaceata</i>	Small Phoenix
<i>Geometridae</i>	Melanthia	<i>procellata</i>	Pretty Chalk Carpet
<i>Geometridae</i>	Angerona	<i>prunaria</i>	Orange Moth
<i>Geometridae</i>	Euphyia	<i>unangulata</i>	Sharp-angled Carpet
<i>Geometridae</i>	Perizoma	<i>alchemillata</i>	Small Rivulet
<i>Geometridae</i>	Hypomecis	<i>punctinalis</i>	
<i>Geometridae</i>	Ematurga	<i>atomaria</i>	Common Heath
<i>Notodontidae</i>	Stauropus	<i>fagi</i>	Lobster Moth
<i>Geometridae</i>	Eupithecia	<i>centaureata</i>	Lime-speck Pug
<i>Notodontidae</i>	Notodonta	<i>ziczac</i>	Pebble prominent

<i>Notodontidae</i>	Pheosia	<i>tremula</i>	Swallow Prominent
<i>Notodontidae</i>	Pterostoma	<i>palpina</i>	Pale Prominent
<i>Notodontidae</i>	Clostera	<i>anachoreta</i>	Scarce Cholorate-tip
<i>Notodontidae</i>	Clostera	<i>curtula</i>	Cholorate-tip
<i>Geometridae</i>	Eupithecia	<i>succenturiata</i>	Bordered Pug
<i>Lymantriidae</i>	Euproctis	<i>similis</i>	Yellow-tail
<i>Arctiidae</i>	Lithosia	<i>quadra</i>	Four-spotted footman
<i>Geometridae</i>	Lomaspilis	<i>marginata</i>	Clouded Border
<i>Geometridae</i>	Ligdia	<i>adustata</i>	Scorched Carpet
<i>Geometridae</i>	Macaria	<i>alternata</i>	Peacock Moth
<i>Geometridae</i>	Chiasmia	<i>clathrata</i>	Latticed heath
<i>Geometridae</i>	Tephрина	<i>arenacearia</i>	
<i>Geometridae</i>	Plagodis	<i>pulveraria</i>	Scorched Wing
<i>Geometridae</i>	Plagodis	<i>dolabraria</i>	Barred Umber
<i>Geometridae</i>	Epione	<i>repandaria</i>	Bordered Beauty
<i>Geometridae</i>	Therapis	<i>flavicaria</i>	
<i>Geometridae</i>	Hypoxystis	<i>pluviaria</i>	
<i>Geometridae</i>	Selenia	<i>dentaria</i>	Early Thorn
<i>Geometridae</i>	Selenia	<i>tetralunaria</i>	Purple Thorn
<i>Geometridae</i>	Ourapteryx	<i>sambucaria</i>	Swallow-tailed Moth
<i>Geometridae</i>	Biston	<i>betularia</i>	Peppered Moth
<i>Geometridae</i>	Ascotis	<i>selenaria</i>	
<i>Geometridae</i>	Ectropis	<i>crepuscularia</i>	Engrailed
<i>Geometridae</i>	Lomographa	<i>temerata</i>	Clouded Silver
<i>Noctuidae</i>	Laspeyria	<i>flexula</i>	Beautiful Hook-tip
<i>Noctuidae</i>	Earias	<i>clorana</i>	Creambordered Greenpea
<i>Notodontidae</i>	Phalera	<i>bucephala</i>	Buff-tip
<i>Notodontidae</i>	Furcula	<i>furcula</i>	Sallow Kitten
<i>Notodontidae</i>	Spatalia	<i>argentina</i>	
<i>Notodontidae</i>	Clostera	<i>pigra</i>	Small Chocolate-tip
<i>Lymantriidae</i>	Calliteara	<i>fascelina</i>	Dark Tussock
<i>Lymantriidae</i>	Lymantria	<i>dispar</i>	Gypsy Moth
<i>Lymantriidae</i>	Euproctis	<i>chrysorrhoea</i>	Brown-tail
<i>Arctiidae</i>	Eilema	<i>complana</i>	Scarce Footman
<i>Arctiidae</i>	Phragmatobia	<i>fuliginosa</i>	Ruby Tiger
<i>Arctiidae</i>	Spilosoma	<i>urticae</i>	Water Ermine
<i>Arctiidae</i>	Spilosoma	<i>lubricipeda</i>	White Ermine
<i>Arctiidae</i>	Dysauxes	<i>ancilla</i>	
<i>Noctuidae</i>	Paracolax	<i>tristalis</i>	Clay fan-foot
<i>Noctuidae</i>	Pyrrhia	<i>umbra</i>	Bordered Sallow
<i>Noctuidae</i>	Rivula	<i>sericealis</i>	Straw Dot
<i>Noctuidae</i>	Colobochyla	<i>salicalis</i>	Lesser Belle
<i>Noctuidae</i>	Phytometra	<i>viridaria</i>	Small Purple-barred
<i>Noctuidae</i>	Hypena	<i>proboscidalis</i>	Snout
<i>Noctuidae</i>	Hypena	<i>rostralis</i>	Buttoned Snout
<i>Noctuidae</i>	Catocala	<i>fulminea</i>	
<i>Noctuidae</i>	Catocala	<i>hymenaea</i>	
<i>Noctuidae</i>	Lygephila	<i>craccae</i>	Blackneck
<i>Noctuidae</i>	Calyptra	<i>thalictri</i>	
<i>Noctuidae</i>	Colocasia	<i>coryli</i>	Nut-tree Tussock
<i>Noctuidae</i>	Acronicta	<i>megacephala</i>	Poplar Grey
<i>Noctuidae</i>	Acronicta	<i>strigosa</i>	Marsh Dagger
<i>Noctuidae</i>	Acronicta	<i>rumicis</i>	Knot-grass
<i>Noctuidae</i>	Emmelia	<i>trabealis</i>	Spotted Sulpher

<i>Noctuidae</i>	Protodeltote	<i>pygarga</i>	Marbled White Spot
<i>Noctuidae</i>	Deltote	<i>bankiana</i>	Silver Barred
<i>Noctuidae</i>	Pseudeustrotia	<i>candidula</i>	
<i>Noctuidae</i>	Abrostola	<i>tripartita</i>	Spectacle
<i>Noctuidae</i>	Macdunnoughia	<i>confusa</i>	Dewick's Plusia
<i>Noctuidae</i>	Diachrysia	<i>stenochrysis</i>	
<i>Noctuidae</i>	Autographa	<i>gamma</i>	Silver Y
<i>Noctuidae</i>	Trachea	<i>atriplicis</i>	Orache
<i>Noctuidae</i>	Heliothis	<i>viriplaca</i>	Marbled Clover
<i>Noctuidae</i>	Lacanobia	<i>contigua</i>	Beautiful Brocade
<i>Noctuidae</i>	Lacanobia	<i>oleracea</i>	Bright-line Brown-eye
<i>Noctuidae</i>	Hada	<i>plebeja</i>	Shears
<i>Noctuidae</i>	Mamestra	<i>brassicae</i>	Cabbage Moth
<i>Noctuidae</i>	Amphipoea	<i>lucens</i>	Large Ear
<i>Noctuidae</i>	Mythimna	<i>conigera</i>	Brown-line Bright-eye
<i>Noctuidae</i>	Mythimna	<i>ferrago</i>	Clay
<i>Noctuidae</i>	Xestia	<i>ditrapezium</i>	Triple-spotted Clay
<i>Noctuidae</i>	Hoplodrina	<i>octogenaria</i>	Uncertain
<i>Noctuidae</i>	Rusina	<i>ferruginea</i>	Brown Rustic
<i>Noctuidae</i>	Polyphaenis	<i>viridis</i>	Guernsey Underwing
<i>Noctuidae</i>	Actinotia	<i>polyodon</i>	Purple Cloud
<i>Noctuidae</i>	Eucarta	<i>amethystina</i>	Cumberland Gem
<i>Noctuidae</i>	Eucarta	<i>virgo</i>	
<i>Noctuidae</i>	Ipimorpha	<i>retusa</i>	Double Kidney
<i>Noctuidae</i>	Cosmia	<i>pyralina</i>	Lunar-spotted Pinion
<i>Noctuidae</i>	Cosmia	<i>trapezina</i>	Dun-bar
<i>Noctuidae</i>	Apamea	<i>crenata</i>	Clouded-bordered Brindle
<i>Noctuidae</i>	Mesoligia	<i>furuncula</i>	Cloaked Minor
<i>Noctuidae</i>	Archanara	<i>neurica</i>	White-mantled Wainscot
<i>Noctuidae</i>	Axylia	<i>putris</i>	Flame
<i>Noctuidae</i>	Xestia	<i>c-nigrum</i>	Setaceous Hebrew-character
<i>Noctuidae</i>	Agrotis	<i>segetum</i>	Turnip Moth
<i>Noctuidae</i>	Agrotis	<i>exclamationis</i>	Heart and Dart
<i>Cossidae</i>	Cossus	<i>cossus</i>	Goat Moth
<i>Cossidae</i>	Zeuzera	<i>pyrina</i>	Leopard Moth

During the preparation of the report, the following new species appeared at light: *Arctia caja* (Garden Tiger), *Hydraecia micacea* (Rosy Rustic), *Tyta luctuosa* (Four-spotted), *Perizoma flavofasciata* (Sandy Carpet), *Idaea ochrata* (Bright Wave), *Idaea rusticata*, *Scopula flaccidaria*, *Crocallis elinguaris* (Scalloped Oak) *Pseudoips prasinana* (Green Silver-lines) and *Eilema lutarella*. Day-flying moths recorded included *Zygaena filipendulae* (6-spot Burnet), *Z. carniolica*, *Z. ephialtes*, *Autographa gamma* (Silver Y), *Autographa bractea* (Gold Spangle), *Scotopteryx bipunctaria* (Chalk Carpet) and *Scotopteryx chenopodiata* (Shaded Broad-bar).

Appendix 3

Butterflies recorded at Gomorszolos (Site A):
23-25. July 2006.

Papilionidae

Papilio machaon	Swallowtail
Iphiclides podalirius	Scarce Swallowtail

Pieridae

Pieris brassicae	Large White
Artogeia rapae	Small White
Artogeia napi	Green-veined White
Pontia edusa	Eastern Bath White
Colias hyale	Pale Clouded Yellow
Colias crocea	Clouded Yellow
Colias alfacariensis	Berger's Clouded Yellow
Gonopteryx rhamni	Brimstone
Leptidea sinapis	Wood White

Lycaenidae

Callophrys rubi	Green Hairstreak
Lycaena dispar	Large Copper
Lycaena tityrus	Sooty Copper
Everes argiades	Short-tailed Blue
Everas alcetas	Provencal Short-tailed Blue
Cupido minimus	Small Blue
Cupido osiris	Osiris Blue
Celastrina argiolus	Holly Blue
Glaucopsyche alexis	Green-underside Blue
Maculinia arion ligurica	Large Blue
Plebejus argus	Silver-studded Blue
Plebejus idas	Idas Blue
Plebejus argyrognomon	Reverdin's Blue
Cyanirins semiargus	Mazarine Blue
Agrodiaetus admetus	Anomalous Blue
Meleageria daphnis	Meleager's Blue
Polyommatus icarus	Common Blue

Riodinidae

Hamearus lucina

Duke of Burgundy

Nymphalidae

Apatura ilia

Lesser Purple Emperor

Neptis sappho

Common Glider

Inachis io

Peacock

Vanessa atalanta

Red Admiral

Vanessa cardui

Painted Lady

Aglais urticae

Small Tortoiseshell

Polygonia c-album

Comma

Araschnia levana

Map

Argynnis aglaja

Dark Green Fritillary

Issoria lathonia

Queen of Spain Fritillary

Brenthis hecate

Twin-spot Fritillary

Brenthis daphne

Marbled Fritillary

Brenthis ino

Lesser Marbled Fritillary

Clossiana dia

Weaver's Fritillary

Melitaea didyma

Spotted Fritillary

Mellicta aurelia

Nickerl's Fritillary

Mellicta britomartis

Assmann's Fritillary

Satyridae

Melanargia galathea

Marbled White

Minois dryas

Dryad

Maniola jurtina

Meadow Brown

Aphantopus hyperantus

Ringlet

Coenonympha pamphilus

Small Heath

Coenonympha arcania

Pearly Heath

Coenonympha glycerion

Chestnut Heath

Hesperiidae

Pyrgus malvae

Grizzled Skipper

Carcharodus alceae

Mallow Skipper

Erynnis tages

Dingy Skipper

Thymelicus lineola

Essex Skipper

Thymelicus sylvestris

Small Skipper

Hesperia comma

Silver-spotted Skipper

Ochlodes venatus

Large Skipper

Appendix 4 Butterflies of the Szuhafo, Latrany Valley (Site B):
26. July 2006.

Papilionidae

Papilio machaon	Swallowtail
Iphiclides podalirius	Scarce Swallowtail

Pieridae

Pieris brassicae	Large White
Artogeia rapae	Small White
Artogeia napi	Green-veined White
Colias alfacariensis	Berger's Clouded Yellow
Gonopteryx rhamni	Brimstone
Leptidea sinapis	Wood White

Lycaenidae

Callophrys rubi	Green Hairstreak
Lycaena vigaureae	Scarce Copper
Lycaena tityrus	Sooty Copper
Everes argiades	Short-tailed Blue
Everas alcetas	Provençal Short-tailed Blue
Cupido minimus	Small Blue
Cupido osiris	Osiris Blue
Glaucopsyche alexis	Green-underside Blue
Maculinia arion ligurica	Large Blue
Scolitantides orion	Chequered Blue
Plebejus argus	Silver-studded Blue
Plebejus argyrognomon	Reverdin's Blue
Czanirins semiargus	Mazarine Blue
Agrodiaetus admetus	Anomalous Blue
Meleageria daphnis	Meleager's Blue
Lysandra coridon	Chalkhill Blue
Polyommatus icarus	Common Blue

Riodinidae

Hamearus lucina	Duke of Burgundy
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Nymphalidae

Apatura ilia
Neptis sappho
Inachis io
Vanessa atalanta
Vanessa cardui
Aglais urticae
Polygonum c-album
Araschnia levana
Argynnis paphia
Argynnis laodice
Argynnis aglaja
Argynnis adippe
Issoria lathonia
Brenthis ino
Clossiana selene
Clossiana dia
Melitaea didyma
Mellicta athalia
Mellicta aurelia
Mellicta britomartis

Lesser Purple Emperor
Common Glider
Peacock
Red Admiral
Painted Lady
Small Tortoiseshell
Comma
Map
Silver-washed Fritillary
Pallas Fritillary
Dark Green Fritillary
High Brown Fritillary
Queen of Spain Fritillary
Lesser Marbled Fritillary
Small Pearl-bordered Fritillary
Weaver's Fritillary
Spotted Fritillary
Heath Fritillary
Nickerl's Fritillary
Assmann's Fritillary

Satyridae

Melanargia galathea
Hipparchia fagi
Minois dryas
Maniola jurtina
Hyponephele lycaon
Aphantopus hyperantus
Coenonympha pamphilous
Coenonympha arcania
Coenonympha glycerion
Pararge aegeria

Marbled White
Woodland Grayling
Dryad
Meadow Brown
Dusky Meadow Brown
Ringlet
Small Heath
Pearly Heath
Chestnut Heath
Speckled Wood

Hesperiidae

Pyrgus malvae
Carcharodus alceae
Erynnis tages

Grizzled Skipper
Mallow Skipper
Dingy Skipper

Thymelicus lineola
Thymelicus sylvestris
Hesperia comma
Ochlodes venatus

Essex Skipper
Small Skipper
Silver-spotted Skipper
Large Skipper