DOĞA KORUMA MERKEZİ
NATURE CONSERVATION CENTRE

Conservation Strategy for Butterflies in Turkey

ERCİYES ÜNİVERSİTESİ 1978

Butterfly CONSERVATION EUROPE

De Vlinderstichting

Ministry of Economic Affairs, Agriculture and Innovation

Conservation Strategy for Butterflies in Turkey
Karaçetin, E., H.J. Welch, A. Turak, Ö. Balkız ve G. Welch. 2011.

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Doğa Koruma Merkezi, Ankara, Turkey

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Evrim Karaçetin, Hilary J. Welch,
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Doğa Koruma Merkezi
The Nature Conservation Centre (DKM) works in partnership with government, NGOs, research institutions, experts and volunteers, aiming to develop national capacity and a sound scientific and technical basis for effective nature conservation. It encourages and facilitates the systematic collection and analysis of biodiversity and other data, and uses these both to identify priority areas for conservation, and to develop sustainable resource-use plans which will benefit biodiversity and people.

DKM is the Turkish representative of Butterfly Conservation Europe (BCE), an umbrella organization for a network of partners and individuals which aims both to stimulate and co-ordinate conservation action for butterflies, moths and their habitats across Europe. BCE and Dutch Butterfly Conservation are partnering DKM in the project Developing a basis for the active conservation of Turkey's butterflies (2009-11) funded by the Dutch Government's BBI-Matra programme.

http://www.bc-europe.org

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Note: This English version of the *Conservation Strategy for Butterflies in Turkey* omits three sections included in the Turkish version, they are:

Turkey's biodiversity and its importance for butterflies
The status of butterflies in Turkey
A summary of the methodology used to identify the Prime Butterfly Areas (but see online *Appendix 3*)

Foreword

Bahtiyar Kurt

Conservation Director
Nature Conservation Centre (DKM)

Ankara, Turkey, May 2011

©Hilary & Geoff Welch

False Apollo (*Archon apollinus*)

Some love birds, some enjoy identifying plants;
Some take a course in dendrology to learn about trees,
some get great pleasure from merely taking photographs;
Some wait for summer to run into their garden, some set out for a picnic at five in the morning;
Some miss their home town, some miss the smell of grass.

People's interest in nature varies. This publication – the *Conservation Strategy for Butterflies in Turkey* – was prepared by the Nature Conservation Centre (DKM), a group of people with a wide range of feelings and motivations to conserve nature. In 2010, I was invited to join this remarkable team.

For me, it was birds which brought me to nature conservation. Then, when I started working for DKM, I tried adjusting my focus to look at lower levels to see butterflies. It was like starting to study nature all over again; my senses of wonder and joy were re-awakened.

I re-experienced that, when we first begin to discover nature, we are amazed by our new experiences and ask ourselves, 'How did I miss all this before?' Then, as the initial wonder turns to fascination and we observe with a more experienced eye, we realise that these incredible creatures are facing many threats. Concerned, we start to look for solutions and discover that, whatever we want to protect – butterflies, birds, forests, steppes – what we need to do is the same.

So, although the aim of this Strategy is to conserve butterflies, all those involved in its preparation have been aware that its successful realisation will in fact contribute to the conservation of a wide range of species and habitats. I thus see this document as a valuable guide for all involved in nature conservation, and believe that it will stand as a milestone for conservation in Turkey.

The next stage is implementation; the Strategy is only valuable if it is used. We very much hope that the synergies developed during its preparation will enable us all to find ways to actively cooperate for the future of butterflies.

Take a look, butterflies truly are amazing.

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Foreword

Josef Settele

Chairman
Butterfly Conservation Europe (BCE)

Halle, Germany, May 2011

Halting biodiversity decline is a major challenge. Almost daily we hear a lot about the threats to large and conspicuous animals, but about insects we hear very little. Yet invertebrates comprise more than half of all the species known to science and play a vital role in the functioning of the world's ecosystems. They also have short life-cycles and respond rapidly to change. So we should be extremely concerned that they have declined far more rapidly than other taxa in modern European landscapes.

The sheer diversity of butterflies in Turkey – around 380 species – is stunning. By comparison there are 482 species recorded in the whole of Europe. The importance of Turkey is further underlined by the number of endemic species, of which there are 45, and also the near endemics – another 21. With Turkey as a candidate EU Member State, Butterfly Conservation Europe views the potential 'addition' of this rich heritage of butterflies to the EU's list of conservation responsibilities with both excitement and concern.

The Red Book of Butterflies in Turkey, published by DKM earlier this year with the support and involvement of experts in the BCE network, presented the first ever objective assessment of the national conservation status of the entire Turkish butterfly fauna. Hard on its heels comes the present document, presenting and assessing the threats to butterflies and their habitats throughout Turkey, identifying those sites which urgently need protection, and presenting practical conservation actions to address the drivers of the threats – all of which are some form of human impact on the environment.

Conserving butterflies in Turkey is evidently a priority, and with these two documents now at hand it really seems that something concrete and effective can be achieved. I am delighted by the collaborative way that this Conservation Strategy has been developed, and the Butterfly Conservation Europe network now looks forward to supporting its implementation. I hope that the Strategy will encourage action to conserve and treasure butterflies, not just because healthy butterfly populations mean a healthy environment for ourselves, but also for their sheer beauty and the joy they bring to our lives.

Staudinger's steppe brown (*Hyponephele naricoides*)

Summary

©Hilary & Geoff Welch

Çoruh Valley, Artvin

Since the 1980s there has been a growing interest in Turkey's butterflies. This has been fuelled by the extraordinarily rich diversity of species and the continuing discovery of new taxa. With a current checklist of around 380 species, including 45 endemics, Turkey supports more butterfly species than any country in Europe.

In the last 30 years much has been published on Turkey's butterflies – disseminating information on distributions, ecology, identification, new species and developments in taxonomy. All of this has both initiated serious study of butterflies by amateur enthusiasts and facilitated the inclusion of butterflies in conservation studies, developing technical tools for conservation, encouraging butterfly watchers to get involved in collecting and sharing information for use in conservation, and creating an awareness of butterflies among the general public.

With the digitised butterfly data set, updated national checklist and national Red List of threatened species, the next task has been to use objective computer aided procedures to identify the core set of Prime Butterfly Areas (PBAs). The initial set of 65 sites selected and presented in this document includes representation of every species in Turkey. By providing these sites with effective protection, we can be confident we have a good and efficient basis from which to conserve all of Turkey's butterflies.

The next concern is the wider environment. Butterflies are not and should not become restricted to protected areas. Butterflies are signs of functioning ecosystems so we should ensure that they remain widespread and common. To achieve this we must develop, or relearn, ways to use the landscape and its natural resources sustainably.

This National Conservation Strategy has been developed by compiling a list of the threats to butterflies, and consulting with a variety of experts in developing a detailed list of solutions: conservation actions which have the potential to address the threats in Turkey. Throughout the aim has been to provide effective conservation of important sites and connectivity between butterfly populations by ensuring that the forested, cultivated and grassland landscapes managed by man continue to be managed in a way which is sensitive to the needs of butterflies and other biodiversity.

The result is eight priority actions which will deliver active conservation in eight categories:

1. Law and policy
2. Land protection
3. Species management
4. Information and research
5. Education and awareness
6. Livelihood incentives
7. Capacity building
8. Land management.

Of these, law and policy has been identified as the most important area for action to conserve butterflies in Turkey. Further, implicit in all eight actions is the need for a continual flow of new data on butterflies, to fill gaps in our knowledge and provide updated information on the distribution and status of all species.

In 2021, following IUCN's recommendation of regular ten-yearly updates, it will be time for the Red List to be reviewed. At the same time the threats to all butterflies should be re-analysed and the progress made with the conservation actions reviewed.

In the coming ten years there is thus much to do to ensure a secure future for butterflies in Turkey. DKM is committed to continuing to play an active part in achieving this.

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Romanoff's vernal copper (*Tomares romanovi*)

A short history of butterfly conservation in Turkey

Hilary J. Welch

Senior Conservation Officer
Nature Conservation Centre (DKM)

Butterfly watchers Asuman Gem and Seda Emel Tek

Conservation requires information, and in Turkey the progress of butterfly conservation has closely followed the publication of information. Since 1981 Turkish academics Ahmet Ömer Koçak and Muhabbet Kemal have been publishing checklists and reports on Turkish Lepidoptera (available via the website www.cesa-tr.org), resulting from their own researches or those of their students, thus providing valuable sources of regularly updated information which can be used in developing conservation tools such as red lists. Following the start of this initiative was the publication in 1995 of *Die Tagfalter der Türkei* – by Gerhard Hesselbarth, Harry van Oorschot and Sigbert Wagener with contributions from a large number of academics and amateurs – a three volume work which aimed to bring together all knowledge on Turkey's butterflies. Now, with the third volume of photographs and distribution maps as a butterfly watcher's handbook, and supported by field guides for European species, it was possible for non-academics to begin serious study of butterflies and learn how to identify them in the field, with binoculars and camera.

Sigbert Wagener continued to support butterfly conservation studies in Turkey right up to his death in 2004. He facilitated the inclusion of Turkey in the first European Butterflies Red Data Book (van Swaay and Warren 1999), and identified the Prime Butterfly Areas in Turkey which were included in the European scale study by van Swaay and Warren in 2003. Both these landmark publications were particularly valuable in a European context and demonstrate the international importance of Turkey for butterflies.

The new millennium coincided with an increase in local activities aimed at conserving Turkey's butterflies. On a technical level, 2000 was the first year that *Die Tagfalter der Türkei's* butterfly distribution data was used in studies which aimed to identify and prioritise areas for biodiversity conservation. This work started with Ayşe Turak's PhD thesis in 2000 (*Patterns of species richness, endemism and rarity in Turkey and their use in conservation evaluation*), and continued through the initiation of a long-term programme of regional studies aiming to cover the whole of Turkey, started by Doğal Hayatı Koruma Derneği and WWF-Turkey in 2000, and continued today by the same team of people (now in Doğa Koruma Merkezi)

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Turquoise blue (*Polyommatus dorylas*), Meleager's blue (*P. daphnis*) and *Agrodiaetus* blues on the Turkish field guide. The Lycaenid family is well represented in Turkey with around 160 species.

working together with the Ministry of Environment and Forestry's Biodiversity Monitoring Unit. By the end of 2011 six regional studies will have been completed – Southeast Anatolia, Mediterranean, Lesser Caucasus, Anatolian Diagonal, Aegean and the Black Sea.

In parallel with this, in 2002, Evrim Karaçetin and Ahmet Baytaş joined forces to make butterfly watching a more accessible activity in Turkey. Initially they focused on establishing regular contact with and between butterfly watchers via an email group, and this rapidly became a valuable platform for providing expert help with identification. As the use of digital cameras grew so too did the number of butterfly websites, and today – nine years later – there is a rich resource of butterfly photographs taken by Turkish butterfly watchers available on the internet. At the same time popular articles on butterflies started to be published in magazines such as *National Geographic-Turkey*, *Bilim ve Teknik*, *Atlas* and *Yeşil Atlas*.

In 2007-2008, Ahmet Baytaş' *A Field Guide to the Butterflies of Turkey* was published in English (October 2007) and Turkish (March 2008), and *Türkiye'nin Kelebek Rehberi* – a book providing an introduction to butterflies – was published by Evrim Karaçetin and Ahmet Baytaş (August 2008). With these two publications, butterfly watching became accessible to observers of all abilities, both locals and visitors from abroad.

At the same time, in November 2007, DKM became the Turkish representative of the Butterfly Conservation Europe (BCE) network and its involvement in butterfly conservation activities increased.

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Butterfly watchers Bahar Bilgen, Ayşe Turak and Deniz Biriken with BCE board member, Dirk Maes (*top right*) during training in 2008.

Karanfil Mountain, south Aladağlar

©DKM Archive

With financial support from the Dutch Embassy's KNIP small grants programme, technical support from Evrim Karaçetin, Ahmet Baytaş and Dirk Maes (BCE Board member), and with the resource of the new field guide, four days of training in field identification and survey techniques were delivered to 13 butterfly watchers in June 2008. Immediately after the training, the trainers and 10 of the trainees formed four teams to carry out seven days of fieldwork in the steppes of Central Anatolia and the forest and subalpine meadows of the Kaçkar Mountains, gathering valuable new data for two conservation projects being implemented by DKM.

With the continuing financial support of the Dutch government and building on and benefitting from all the work done to date, DKM went on to implement two further butterfly conservation projects. Between them these developed the tools and capacity to underpin and guide future butterfly conservation in Turkey, and established DKM and its partners as committed advocates and capable implementers of that work. The two projects were very different.

The smaller of the two was developed in response to the concerns of locals in Yusufeli (Artvin), specifically to address the problem of illegal commercial collection of butterflies which appears to occur mainly in Prime Butterfly Areas. The project researched the law and procedures to follow in order to bring a successful prosecution and, following consultation with stakeholders, published the information in an easy to use hand guide which showed how everyone can play their part in stopping this illegal activity.

The larger, two and a half year project, worked on two levels; developing the butterfly watcher network, and producing technical tools for conservation. With the butterfly watchers the aim was to increase the number of committed observers, and to develop their capacity to collect data systematically. The technical tools included: digitised butterfly data; an updated national checklist; a national butterfly red list (published as the *Red Book of Butterflies in Turkey* and available as a pdf in Turkish and English from www.dkm.org.tr); the initial set of Prime Butterfly Areas identified; and the document you are now reading, the *Conservation Strategy for Butterflies in Turkey*. The publication of these outputs, particularly the red list, added further to the capacity of the butterfly watchers by developing their interest and concern for working on and actively conserving threatened species.

Despite the advances in knowledge of Turkey's butterflies, especially in recent years, there is still a huge amount to be done, but the number of people actively working on butterfly research and conservation remains extremely small, especially given the size of Turkey. The Prime Butterfly Areas now provide a foundation set of key sites that need to be protected and managed to conserve representative examples of Turkey's butterfly fauna. However, for effective, sustainable protection, conservation needs to take place at the landscape scale and it is hoped that this strategy will act as a valuable guide, indicating how this may best be achieved.

An assessment of the threats to butterflies in Turkey

Geoff Welch

Conservation Advisor
Nature Conservation Centre (DKM)

Identifying the principal threats to butterflies in Turkey was a fundamental stage in the preparation of the Conservation Strategy and, in order to do this in an objective manner, it was achieved by assigning each threat to one of the standard categories presented by Salafsky *et al*. (2008) – see table 1. This list of standard threats, or adapted versions thereof, is now widely used by many organisations including the Conservation Measures Partnership, IUCN and BirdLife International. With specific reference to butterflies in Turkey, during the threat identification process it became apparent that a lack of many types of information was a major problem and so an additional 'threat' category 'Information gaps' was added to Salafsky *et al*'s original list. In many ways, this lack of information is more of an 'issue' than a 'threat' but understanding why it is an issue and finding solutions is an important part of being able to conserve Turkey's butterflies. Once each threat had been assigned to a category, the importance of each, both currently and in 10 years time, was assessed and scored on a scale of 1 to 3, where 1 is low and 3 high (*see Table 1*). The geographic extent of each threat was also assessed ranging from local – affecting individual sites and species, to national – potentially affecting all species and all sites.

The initial identification of threats was carried out internally by DKM experts together with selected academics and conservationists. The results of this process were summarised and then discussed with relevant stakeholders in a series of one-to-one meetings. Their comments and suggestions were incorporated to give a comprehensive assessment of the current situation. The detailed threat analysis table is given in Appendix 7.

In addition to identifying the threats, the underlying causes (or drivers) of each were identified. This was important as threats often have more than one underlying cause, each requiring a different type of activity to solve. By listing all of the potential activities and then looking for duplications/overlaps, it was first possible to identify the broad types of activity required, and second to prioritise activities so as to concentrate on those which will deliver the greatest benefits in terms of effective conservation of Turkey's butterflies – see *Proposed Conservation Actions for Butterflies in Turkey*.

Of the 44 threats and subcategories shown in table 1: 11 were considered to be not applicable eg. aquaculture; for seven it was considered that there was insufficient or no

Intensive cultivation (Ankara), supports no butterflies

Abandonment of traditional land management – including low intensity grazing with cattle such as shown above – is resulting in the loss of important grassland habitats rich in butterflies.

Table 1. **Standard threats and subcategories** *(adapted from Salafsky et al. [2008])*.
Each subcategory is scored from 1-3 according to the perceived severity of the threat today, and its projected severity in 10 years time (2021). Unscored subcategories are either not considered a significant issue for butterflies, or there is insufficient information to assign a score.

1 = minor threat; requires monitoring but not management
2 = moderate threat requiring management to address it
3 = major threat requiring intensive management

Threat	Subcategory	Present	Future
1. Residential and commercial development	1.1 Housing and urban areas	**3**	**3**
	1.2 Commercial and industrial areas	**3**	**3**
	1.3 Tourism and recreation areas	**3**	**3**
2. Agriculture and aquaculture	2.1 Annual and perennial non-timber crops	**3**	**3**
	2.2 Wood and pulp plantations	**3**	**3**
	2.3 Livestock farming and ranching	**3**	**3**
	2.4 Marine and freshwater aquaculture	-	-
3. Energy production and mining	3.1 Oil and gas drilling	**1**	**1**
	3.2 Mining and quarrying	**3**	**3**
	3.3 Renewable energy	**1**	**2**
4. Transportation and service corridors	4.1 Roads and railroads	**3**	**3**
	4.2 Utility and service lines	**2**	**2**
	4.3 Shipping lanes	-	-
	4.4 Flight paths	-	-
5. Biological resource use (for subsistence or commerce)	5.1 Hunting and collecting terrestrial animals	**1**	**1**
	5.2 Gathering terrestrial plants	**2**	**2**
	5.3 Logging and wood harvesting	**2**	**1**
	5.4 Fishing and harvesting aquatic resources	-	-
6. Human intrusions and disturbance	6.1 Recreational activities	**1**	**2**
	6.2 War, civil unrest and military exercises	-	-
	6.3 Work and other activities	-	-
7. Natural system modification	7.1 Fire and fire suppression	-	-
	7.2 Dams and water management/use	**3**	**3**
	7.3 Other ecosystem modification	**3**	**3**
8. Invasive and other problematic species and genes	8.1 Invasive non-native/alien species	-	-
	8.2 Problematic native species	-	-
	8.3 Introduced genetic material	-	-
9. Pollution	9.1 Household sewage and urban wastewater	**1**	**1**
	9.2 Industrial and military effluents	**1**	**1**
	9.3 Agriculture and forestry effluents	**3**	**3**
	9.4 Garbage and solid waste	-	-
	9.5 Airborne pollutants	**2**	**2**
	9.6 Excess energy	-	-
10. Geological events	10.1 Volcanoes	-	-
	10.2 Earthquakes/tsunamis	-	-
	10.3 Avalanches/landslides	-	-
11. Climate change and severe weather	11.1 Habitat shifting and alteration	**2**	**3**
	11.2 Droughts	-	-
	11.3 Temperature extremes	-	-
	11.4 Storms and flooding	-	-
12. Information gaps	12.1 Observers	**3**	**3**
	12.2 Academic and conservation research	**3**	**3**
	12.3 Surveys and monitoring	**3**	**3**
	12.4 Data	**3**	**3**

information available to allow the threat to be assessed eg. invasive species; this left 26 threats for which conservation action is required. In almost all cases, it was considered that the level of threat will remain the same or increase in the next 10 years. The only threat expected to decrease is the effects of logging and wood harvesting due to recent changes in the process of preparing forest management plans which now requires that biodiversity conservation is an integral part of the plan (*see Forest Management Legislation, 2008*).

The main threats to butterflies are summarised below. See Appendix 7 for more detailed information.

1. Residential and commercial development: national impact.
The principal threats result from uncontrolled urban, industrial and tourism-related expansion, leading to the loss and fragmentation of habitat. In some parts of the country the affects are particularly high, for example the development of second homes in coastal and mountain areas and increasing mass tourism developments along the Aegean and Mediterranean coasts. The largest population of Halicarnas brown (*Maniola halicarnassus*) in the world occurs on the Bodrum peninsula and is in danger of extinction from continuing urbanisation due to tourism. A lack of biodiversity conservation considerations in planning procedures and weak implementation of existing legislation are the main causes.

2. Agriculture and aquaculture: national impact.
The principal threat is loss of habitat, with the underlying causes being: agricultural intensification eg increased use of pesticides and herbicides resulting in direct mortality and/or loss of larval foodplants; land consolidation resulting in a shift from mosaics of habitats to large monocultures; afforestation of steppe grasslands; and loss of habitat structure due to overgrazing. In some areas, a shift from grazing with native breeds of livestock to cross-breeds or more commercial breeds may also be causing habitat changes as the 'new' livestock is not adapted to the terrain (alpine and sub-alpine meadows) or to grazing the native vegetation. According to the Red Book (Karaçetin and Welch, 2011) one in three threatened species are threatened either by the intensification of agriculture or chemical pollution. National policy on agricultural production and rural development and the changing economics of farming are key issues that need to be addressed.

3. Energy production and mining: national impact.
Within this threat, mining and quarrying are considered to be having the greatest impact, principally as the result of habitat loss. This is a major threat to species which have very restricted distributions eg Turkish false argus (*Aricia torulensis*). Airborne pollution from quarries and open cast mines is also thought to be a problem at some sites. A lack of biodiversity conservation considerations and weak implementation of existing legislation are the main causes.

Note that despite the fact that activities such as hydro-electric power plants are considered to provide renewable energy, because they lead to irreversible and large scale

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Greenhouses cover almost the whole of the Finike plain, Antalya: very few butterflies can live in this environment.

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Irrigation, Bursa: this facilitates intensification and results in landscape scale changes which almost no butterfly species can survive.

©Bosse van Swaay

Over-grazing by nomad flocks is considered a problem in the Palandöken Mountains PBA, Erzurum.

©Hilary & Geoff Welch

Gold mine at Demirkaynak, Gümüşhane: this has largely destroyed the type locality of the endemic and Endangered Turkish false argus.

©Didem Ambarlı

Road building, Palandöken Mountains PBA, Erzurum.

©Hilary & Geoff Welch

False Apollo (*Archon apollinus*) caterpillar on its foodplant: the period before it becomes an adult butterfly is when all species are particularly vulnerable to habitat disturbance or damage.

©Hilary & Geoff Welch

Artvin Dam under construction on the Çoruh River, Artvin.

changes in natural systems they are discussed under *7. Natural System Modification*. Drilling and other renewable energy production activities are also resulting in habitat loss but at a much smaller scale.

4. Transportation and service corridors: national impact. The plant communities of the disturbed habitats along roadsides provide nectar for adult butterflies and foodplants for caterpillars. Roadsides also provide wet areas (mud-puddling sites) where the (male) butterflies can find the dissolved minerals they need to bring them into breeding condition. The national policy of road widening and improvement is resulting in widespread habitat loss throughout Turkey and is a major threat for species with restricted distributions eg Rose's blue (*Plejebus rosei*) where road construction is known to have destroyed a large area of habitat at its only known location. Poor road construction techniques and planning of routes are likely to be affecting some species in mountain areas as the result of a loss of small-scale habitat features such as mud-puddling sites. The construction of utility infrastructure is resulting in habitat fragmentation.

5. Biological resource use: local impact.
The illegal collection of butterflies may be having an impact on local populations at well-known butterfly sites – such as Palandöken and the Kaçkar Mountains – or on rare and localised species, but this is not considered to be a major threat at present. However, for very scarce species which are already threatened by habitat loss, such as Mesoptamian blue (*Polyommatus dama*), collecting places a further negative pressure on their small populations. Collection of foodplants for subsistence or sale eg rhubarb (*Rheum ribes*) used by Miller's green hairstreak (*Callophrys mystaphia*) may be a greater threat and be having more of an impact.

6. Human intrusions and disturbance: local impact.
With increased standards of living and mobility, more of the countryside is likely to be affected by recreational activities such as picnicking, camping and off-road driving, leading to a loss or damage of foodplants and larval or pupal stages of butterflies. The cumulative effect of such damage may be important. Large copper (*Lycaena dispar*), and other species which occur in small patches of restricted habitat near settlements and other built habitats, are most at risk.

7. Natural system modification: national and local impact.
The national policy on dam construction for hydro-electric production is resulting in significant loss and fragmentation of habitat nationally and locally. It is a particular threat in the Çoruh River Basin in the species-rich South Kaçkars PBA where there are 27 dam projects (Sucu and Dinçer 2008) and 117 small scale hydro-electric power plants planned (Akpınar *et al.* 2009). The construction of associated infrastructure such as roads and powerlines will result in a significant loss and fragmentation of habitat, and in some areas rivers will be canalised and diverted through mountains via tunnels. The dam and hydro-electric power constructions in the Çoruh Valley comprise the major threat

to the South Kaçkars PBA. In the Çoruh Valley PBA it is likely there will also be localised climate changes associated with the new lakes created.

Land abandonment and changes in land management techniques eg a change from grazing to cutting is also having a significant impact in many rural areas. The underlying causes of this are a combination of dwindling and ageing rural populations, especially in mountain areas, due to migration, and a change in the economics of farming, making small-scale, traditional grazing and hay production uneconomic.

8. Invasive and other problematic species and genes
No known impact on butterflies.

9. Pollution: national impact.
Population increase and industrialisation both lead to higher concentrations of household and industrial pollution. There are major impacts due to the widespread and often excessive use of pesticides, herbicides and fertilisers and the unregulated disposal of surplus chemicals and their packaging. This is resulting in a loss of foodplants, and serious declines in species' numbers and diversity, especially for those species restricted to agricultural areas and their surroundings.

10. Geological events
No known impact on butterflies.

11. Climate change and severe weather: national impact.
Habitat shifting and alteration as the result of changing climate patterns is considered to be the main threat in this category. For example, Mofidi's Fritillary (*Brenthis mofidii*), a near endemic species found in Hakkari province, relies on snow melt in the mountains to support its summer moist grassland habitat. If there is less snow, water supplies may be insufficient in the future. With the changing climate, migratory species are expected to move to alternative areas of suitable habitat. However, localised, sedentary species may be unable to move to new areas if local conditions change. There are models which are being developed on climate changes which consider temperature precipitation and rain, however no study has yet been carried out on how these changes will affect butterflies in Turkey.

12. Information gaps: national impact.
There are currently limitations in the number and ability of butterfly watchers in Turkey which limits our knowledge of the precise distribution and population trends of most species. At the academic level, there is little research on butterflies. As a result there are many species, for example those in the subgenus *Agrodiaetus*, where the precise taxonomic situation of species and subspecies is unknown and there is very little knowledge of their ecology. Without reliable and up to date information on species, it is difficult to plan effective conservation. Additionally, for planners and decision makers much of the existing information on Turkey's butterflies is either unavailable or in a format that is not readily accessible, and this makes it difficult to ensure that butterflies are included in relevant policy and legislation.

Photos ©Hilary & Geoff Welch

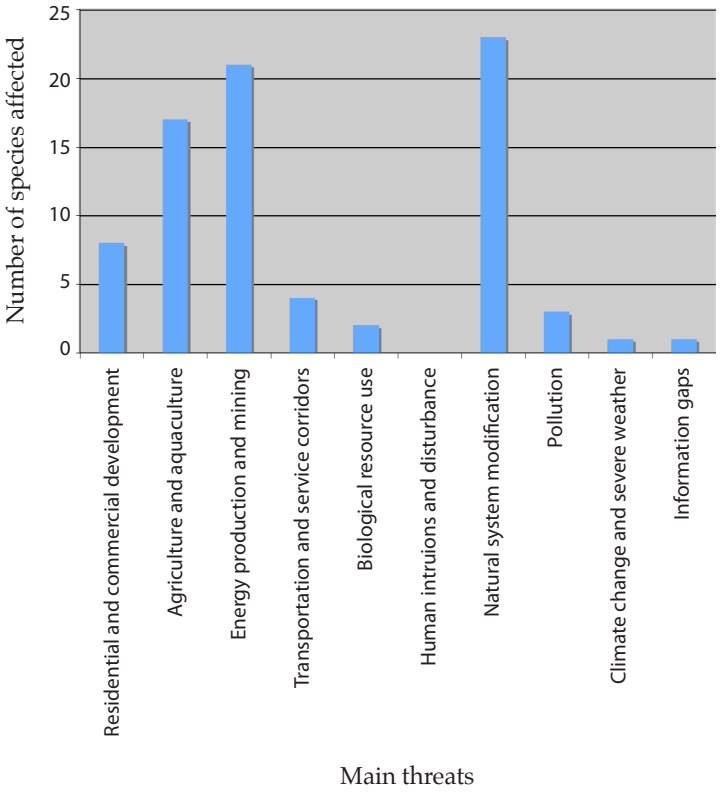
Abandoned meadows in the Küre Mountans, Kastamonu: without regular cutting and grazing the forest is gradually returning and the butterfly species which need the flowery meadows are disappearing.

Spring spraying of crops in Adana: pesticides have a negative effect on all invertebrates, including those which are beneficial to farmers.

Stormy weather, Yozgat: no study has yet been carried out to model how changes in the climate will affect butterflies in Turkey.

Studying the life cycles of Marsh and Steppe Fritillaries, METU Campus PBA, Ankara.

Figure 1. **Analysis of the threats to globally threatened species categorised as CR, EN, VU or NT in Turkey**



To illustrate the relative importance of these threats, an analysis of the 37 nationally threatened and near threatened species (Critically Endangered, Endangered, Vulnerable and Near Threatened) included in the Turkish Red List of Butterflies (Karaçetin and Welch, 2011) is shown in Figure 1. Ideally such an analysis should be carried out for all species in Turkey but for the majority of taxa detailed information is not available.

As the result of the threats assessment we can see that the major threats to butterflies in Turkey stem from the high importance given to policies with economic and development goals, whilst biodiversity and environmental conservation are absent or given a very low priority. Improving and enforcing existing legislation would go a long way to reducing many of these threats.

Proposed conservation actions for butterflies in Turkey

Hilary Welch

Senior Conservation Officer
Nature Conservation Centre (DKM)

The research carried out for the Turkish Red Book, and the analysis involved in identifying the Prime Butterfly Areas and threats has prioritised species, sites and threats. Using all this information it is now possible to categorise and target how and where butterflies can most effectively be conserved.

Methodology

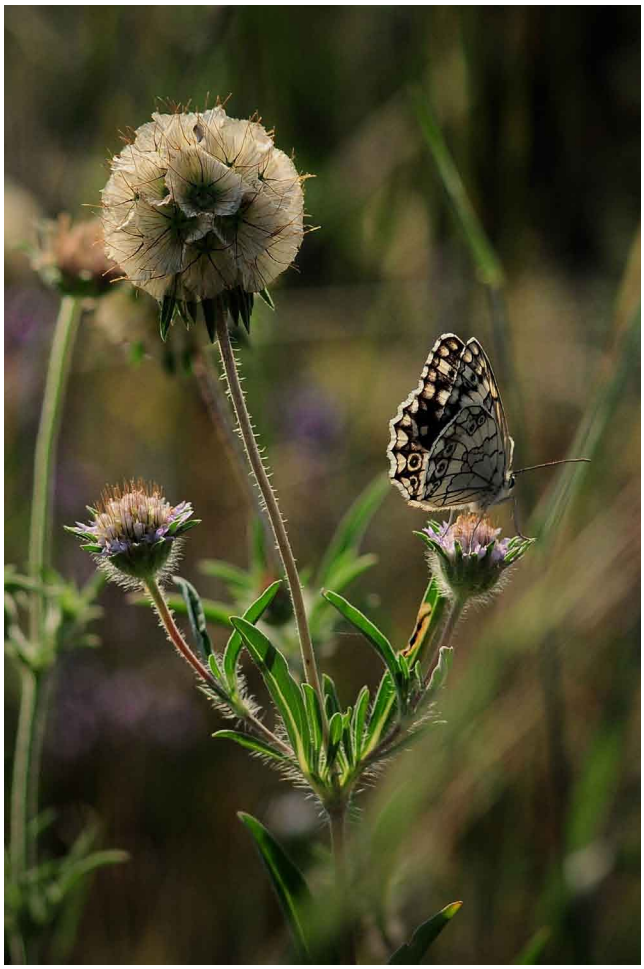
The methodology presented in Salafsky *et al*. (2008) and the process used to identify the threats continued to be followed. Thus a preliminary set of draft conservation actions was developed internally by DKM experts together with selected academics and conservationists, and then discussed and refined through one-to-one meetings with stakeholders. In drawing up the actions the source of the threat (the 'driver') needing to be addressed and the conservation needs of butterflies were considered. The participation of key experts was extremely valuable and facilitated many improvements and additions.

The result was a list of 95 potential conservation actions (*see the full table in Appendix 7: Threats, drivers and conservation actions*). However, despite the careful process, the conservation actions list should only be considered indicative, not exhaustive. It is expected that a greater understanding of the issues to be addressed and on the ground implementation will generate more ideas and more targeted and effective solutions.

Each solution has been assigned to one of eight categories. The first seven are those presented by Salafsky *et al.* (2008) and, following the need to add the extra category of *Information gaps* to the threats and drivers analysis, *Information and research* is similarly added as an eighth conservation action category at the end of table 2 (*overleaf*).

Assigning each action to one category was not simple. Many actions would fit into several categories, depending on which phase of the action was considered; facilitation, implementation or outcome. For example, the action 'Establish a demonstration site for conservation and research in Turkey' is placed in *8. Information and research*, because the principal use of the site will be for conservation research. However, the action also has the potential to deliver benefits under *1. Land protection*, 2. *Land management*, *3. Species management* and *4. Education and awareness*.

©Hale Binay



Balkan marbled white (*Melanargia larissa*)

Table 2. **Conservation action categories**

Category	Subcategory
1. Land protection	1.1 Site / area protection
	1.2 Resource and habitat protection
2. Land management	2.1 Site / area management
	2.2 Invasive / problematic species control
	2.3 Habitat and natural process restoration
3. Species management	3.1 Species management
	3.2 Species recovery
	3.3 Species reintroduction
	3.4 *Ex-situ* conservation
4. Education and awareness	4.1 Formal education
	4.2 Training
	4.3 Awareness and communications
5. Law and policy	5.1 Legislation
	5.2 Policies and regulations
	5.3 Private sector standards and codes
	5.4 Compliance and enforcement
6. Livelihood, economic & other incentives	6.1 Linked enterprises and livelihood alternatives
	6.2 Substitution
	6.3 Market forces
	6.4 Conservation payments
	6.5 Non monetary values
7. External capacity building	7.1 Institutional and civil society development
	7.2 Alliance and partnership development
	7.3 Conservation finance
8. Information and research	8.1 Conservation Research
	8.2 Academic research / desk study
	8.3 Collect and share data

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Balalan valley, South Kaçkars PBA: finding effective ways to encourage local people to continue to manage meadows traditionally is key to conserving the value of this area for butterflies.

Results

A summary of the conservation actions by category

1. Land protection – *3 potential actions*

The main focus here is on identifying a way to provide the Prime Butterfly Areas with effective protection from damaging developments whilst at the same time allowing and promoting the continuation of land management practices which maintain the vegetation composition and structure needed by butterflies. Designation as protected areas may not be the best answer for this as, although this would potentially provide the best protection, management of habitats for wildlife is not a common practice on protected areas in Turkey, and there is a lack of infrastructure on protected areas to undertake it. However, butterflies are species which need habitat management, for example controlled grazing pressure. For this reason, not only in protected areas but also in the wider landscape, having sustainable use (not protection) as the priority is preferable as it would ensure the conservation outcomes required by butterflies. A system of support and control, through mechanisms such as well-designed agri-

environment measures, would allow local communities to continue to manage the land sympathetically and provide the large scale landscape conservation and sustainable use of grassland habitats needed; however, this would not provide protection from damaging developments. With this in mind alternative solutions such as a designation aimed at conserving traditional lifestyles, and development of a demonstration site for conservation and research (see *8. Information and research*) are also included in the conservation actions list.

2. Land management – *4 potential actions*
This category refers to the management of areas under protection or controlled management; the actions presented here are thus in forests and public recreation areas. In all cases the aim is to include consideration of butterflies and other biodiversity in site management. In forests, work is already in hand to incorporate wildlife-friendly management prescriptions into forest management plans.

3. Species management – *3 potential actions*
Sharing the knowledge we have of the threats to butterflies, their population trends and ecology will ensure that as far as possible damaging actions can be ameliorated and beneficial conservation measures can be designed. Developing authoritative science-based Species Action Plans – especially for threatened species and habitat specialists, both of which are particularly vulnerable to change – would enable us to share knowledge with others keen to do what they can to conserve butterflies and their habitats. It would also support updates of the national Red List, thus providing regular feedback on the state of the nation's butterflies and indicating whether conservation measures are having an effect.

4 . Education and awareness – *16 potential actions*
Actions in this category have been identified at many levels, from academic study and technical publications, to public and stakeholder awareness raising:

- To encourage **academic study** through providing Turkish text books on butterfly ecology and providing a platform for the publication of papers on conservation research in Turkey.
- To develop a **caring** and more knowledgeable public through campaigns, posters and popular articles which raise awareness of the value and variety of butterflies.
- To raise the awareness of specific stakeholders through more targeted training in order to **tackle specific threats** such as afforestation of steppes, excessive and unnecessary use of chemicals in the environment, and unnecessary environmental damage due to insensitive developments.
- To develop butterfly watchers committed to providing **data for conservation** by training them in fieldcraft, identification and ecology.

5. Law and policy – *31 potential actions*
The actions fall into three main categories; a) identifying where improvements in legislation are needed, b) enforcement of legislation, and c) directing public money to support changes in policy which result in greener initiatives.

Photos ©Hilary & Geoff Welch

Forests with a varied age and species structure, together with a variety of openings, are rich in butterflies. This forest in Bolu is home to Caucasian festoon (*Zerynthia caucasica*).

A freshly emerged steppe fritillary (*Euphydryas orientalis*) butterfly, an Endangered species (above) and a girl with her model of a butterfly and its chrysalis (below).

Photos ©Hilary & Geoff Welch

Developing agri-environment measures which deliver both biodiversity and secure livelihoods for farmers requires extensive consultation and the involvement of stakeholders at all levels.

Improvements in legislation: to develop and restore effective legal instruments for protecting important sites and species from damaging developments, ensuring that the active protection of biodiversity – particularly of threatened species – is firmly embedded in legislation. Examples of ways in which this could be achieved are through recognising Species Action Plans and Red Lists as legal documents, ensuring that the qualifying criteria for Environmental Impact Assessments (EIAs) are appropriate for effective protection of sites important for butterflies and biodiversity, and including delivery of biodiversity conservation in organic farming legislation.
Enforcement of legislation: to ensure that existing legal instruments which have the power to deliver positive benefits for biodiversity, such as the Rangeland Act, are effectively enforced, and that their impact on biodiversity is monitored through scientifically sound compliance mechanisms developed and implemented by qualified ecologists.
Greener policies: these include developing and enforcing stricter controls which consider the effects of emissions on biodiversity, promoting wise water use, pollution-free public transport, basin-scale planning for dams and hydro-electric power plants, and energy efficiency.

6. Livelihood, economic and other incentives – *14 potential actions*
For butterfly and biodiversity conservation to be effective it is important to reduce the likelihood of local or regional extinctions by maintaining connectivity between populations. This category addresses the issue of fragmentation of natural habitats by delivering landscape scale conservation management of habitats rich in butterflies. It promotes use of agri-environment schemes to promote landscape mosaics (as opposed to monocultures) and supports traditional grazing and haying practices – two basic tenets of High Nature Value farming which are both of direct benefit to butterflies and biodiversity. At the same time it promotes rural development and sustainable use initiatives which aim to keep local communities together and thus ensure there are people present to continue managing the land, and uses market forces to put a value on the products of wildlife-friendly, traditional land use practices.

7. External capacity building – *5 potential actions*
This category targets nonfinancial support and capacity building, forming and facilitating partnerships and networks, and raising or providing funds for conservation. Without the necessary capacity and infrastructure in organisations, business, government and local communities, it will not be possible to deliver effective conservation. Included in this category is establishing an organisation specialising in butterfly conservation.

8. Information and research – *19 potential actions*
The main target is to find ways to obtain a sustainable stream of reliable data on species' distributions, ecology and population trends. This requires developing both field methodologies and the size and commitment of the workforce to collect the data. The actions in this category

are focused on:

- Using the available data to direct conservation action to identify the priority areas to target for agri-environment support. For example this could be done by by overlapping data on Prime Butterfly Areas and important grassland butterfly communities with agricultural/rangeland land use data layers.
- Through the provision and feedback of information, to encourage academicians and butterfly watchers to collect new data which will fill temporal and spatial gaps and provide a picture of trends.
- Conservation research to support conservation action, for example into the effects of climate change in order to target conservation effort at vulnerable species; on traditional land management practices and regimes in order to guide the development of optimal habitat management prescriptions; to ascertain the impact of pollutants on invertebrates and guide changes in legislation.

Priority conservation categories and actions

The final phase of the assessment was to identify the conservation priorities by analysing the complete actions list (*see Appendix 7*). This was done in two different ways.

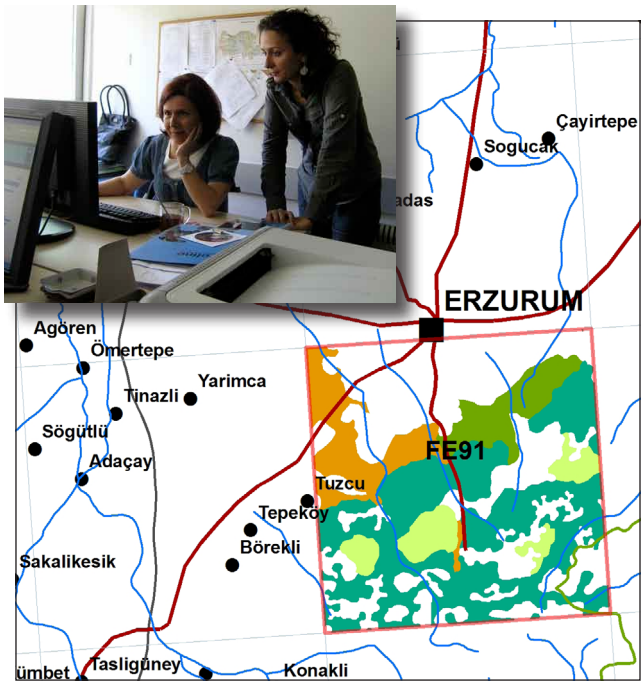
1. Number of actions in each conservation category
With the actions assigned to categories it is clear that there are far more actions in some categories than others. This can be seen in *Table 3*. ***League table of conservation actions by category*** where there is a disproportionate concentration of activities in *Law and policy*. Additionally, only in the top two categories – *Law and policy* and *Information and research* – are there actions needed to address every category of threat. Thus work in the top action categories in table 3 could be considered the most effective use of resources as work in these areas will address more threats in more categories.

2. The 'occurrence score' of each action
Looking down the list of conservation actions in Appendix 7 it can be seen that some actions appear on the list several times – against different threats and in different categories. Thus some actions have the potential to address a range of threats, making them efficient for delivering conservation.

For example, the action – *Visit all core Prime Butterfly Areas to determine continued presence of key species, compile comprehensive species lists, identify threats, define practical boundaries and research conservation opportunities* – appears against 13 different threats in seven different threat categories. If the number of times an action appears on the list is considered a measure of its conservation efficiency, these occurrence scores can be used as another prioritisation tool.

Using the occurrence scores of the individual actions to prioritise the conservation action categories (*see Table 4. **League table of conservation action categories using individual action occurrence scores***), the top two scoring categories remain unchallenged and with greatly increased scores – further emphasising their importance.

Photo ©Hilary & Geoff Welch



The land use map layers for the PBAs (*see Appendix 5*), made available through a collaboration with the Ministry of Agriculture's General Directorate of Agricultural Production and Development, will be very valuable for planning fieldwork and defining the boundaries of PBAs.

Table 3. **League table of conservation action categories based on the number of actions in each category**

No. of actions	Conservation action category
31	Law and policy
19	Information and research
16	Education and awareness
14	Livelihood, economic and other incentives
5	External capacity building
3	Land protection
4	Land management
3	Species management
95	**TOTAL ACTIONS**

Table 4. **League table of conservation action categories based on individual action occurrence scores**

Total of action occurrence scores	Conservation action category
123	Law and policy
45	Information and research
27	Livelihood, economic and other incentives
27	Species management
22	Education and awareness
15	Land protection
10	External capacity building
4	Land management

Table 5. **Top scoring conservation actions in each category, in occurrence score order**

Score	Conservation action description	Category	Notes
19	Enable the implementation of legislation and procedures which benefit butterflies and biodiversity.	Law and Policy	
13	Provide Prime Butterfly Areas with a conservation 'umbrella' status which provides protection from damaging developments and supports the continuation of traditional agricultural practices which maintain the value of the sites for butterflies.	Land protection	
13	Draw up Species Action Plans for threatened species on the Turkish Red List, and use them as a resource in working together with nature conservationists, planners, investors and other stakeholders and land users.	Species management	
13	Visit all core Prime Butterfly Areas to determine continued presence of key species, compile comprehensive species lists, identify threats, define practical boundaries and research conservation opportunities.	Information and research	
4	Raise awareness of the vital role of invertebrates, and of the value of butterflies as visible indicators ecosystem health, selecting regional flagship species to tackle specific issues.	Education and awareness	
4	Together with Ministry of Food, Agriculture & Animal Husbandry and other experts, and drawing on the experience of EU member states, define the prescriptions for inclusion in agri-environment measures which will benefit butterflies, promoting landscape mosaics, High Nature Value farming and organic farming practices.	Livelihood, economic and other incentives	
3	Work together with the Ministry of Food, Agriculture & Animal Husbandry and other relevant bodies to use ÇATAK and IPARD funding opportunities creatively to support the development of agri-environment and rural development initiatives, adding a criteria to the project selection process whereby actions which aim to manage or improve habitats for butterflies and/or other biodiversity are given priority.	External capacity building	
1	Develop and disseminate conservation action recommendations for the management of grasslands and forests which benefit butterflies.	Land management	All the actions in this category scored 1 so the most generic action has been selected as the priority.

For the prioritisation of the conservation actions the occurrence scores were the principal tool used. Table 5 presents the top scoring conservation actions in each category i.e. the actions which are identified as addressing the most threats. Overall, these are considered the eight most conservation efficient actions and thus the priorities for implementation. Nevertheless, it should be remembered that every conservation action listed in Appendix 7 has been identified as important and necessary for the effective conservation of butterflies in Turkey.

It is recommended that this assessment be updated in 2021 (i.e. after a 10 year interval), using new, up-to-date data. An update will make it possible to assess what progress has taken place and to redefine the priorities in the light of the new information.

It is hoped that this document will be used collaboratively by all individuals and organisations responsible for and interested in conserving butterflies in Turkey. By working together significant steps for their conservation can be made.

Acknowledgements

In developing this conservation strategy, the authors were keen to ensure it would be objective and credible by following a systematic, widely tested and accepted approach which could be replicated and followed by others. It was also important that the process facilitated the transparent and effective participation of a range of specialists. The threats and conservation actions classification system developed by Salafsky et al. (2008) provided just such an approach and required only small adaptations to the classification to make it applicable to butterflies and the Turkish context. The resulting table of threats, their drivers and the potential solutions (conservation actions) proved to be a very useful, informative tool for obtaining input from a range of experts on specific issues.

DKM is extremely grateful to the following individuals and organisations for their time and the valuable suggestions they contributed to the development and fine-tuning of the table which is the foundation of this Strategy: Güneşin Aydemir, Buğday Association – an NGO working closely with the Ministry of Food, Agriculture and Animal Husbandry, particularly on High Nature Value and organic farming; Dr. Ümit Özcan, Secretary of the Union of Turkish Chambers of Engineers and Architects, and City Planners; Yıldıray Lise, United Nations Development Programme (UNDP) Turkey; Pille Koorberg, Beyhan Aygün and Pınar Hışır – coordinator and module leaders for the Environment and Countryside under IPARD EU twinning project, Strategic Planning Department of the Ministry of Food, Agriculture and Livestock; Bahar Bilgen, butterfly watcher and civil engineer; Onat Basbay, butterfly watcher and mining expert; and Ayse Işık Ezer, nature conservation expert.

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Male butterflies feed on minerals to bring them into peak condition for breeding. Here there are Amanda's, common and green underside blues (*Polyommatus amandus*, *P. icarus* and *Glaucopsyche alexis*).

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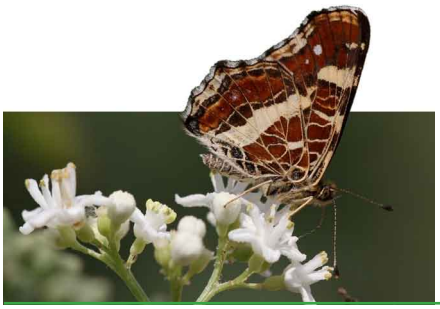
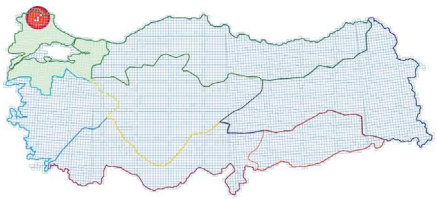
Appendix 1: Gazetteer of Prime Butterfly Areas



©Tamer Arda

Map butterfly
(*Araschnia levana*)

Marmara



PBA no. **Name**
MA01 Istranca Mountains / North Kırklareli

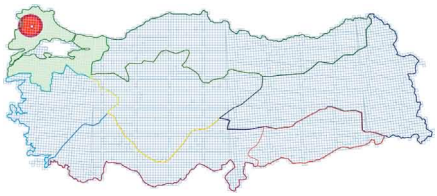
Province (District)
Kırklareli (Kırklareli)

Square codes & Central coordinates
NG12 27°10'47.64 E, 41°46'30.36 N
NG22 27°18'00.72 E, 41°46'29.28 N
NG23 27°18'02.52 E, 41°51'53.64 N
NG34 27°25'18.12 E, 41°57'16.56 N

Altitudinal range of records
180–600 m

Number of priority species
7

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Zerynthia polyxena								•
Parnassius mnemosyne								•
Lycaena ottomana					•			
Lycaena dispar						•		•
Scoltitantides orion						•		
Apatura metis								•
Aricia anteros								



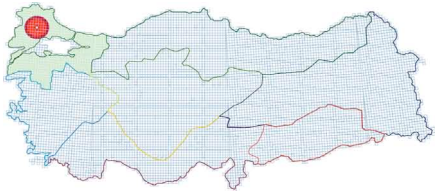
PBA no. **Name**
MA02 Babaeski

Province (District)
Kırklareli (Babaeski, Pekmezli)

Square code & Central coordinates
NF08 27°03'33.48 E, 41°24'53.64 N

Altitudinal range of records
40–40 m

Number of priority species
0: this square selected because it is the only known location in Turkey for safflower skipper (*Pyrgus carthami*).



PBA no. **Name**
MA03 Düğüncübaşı

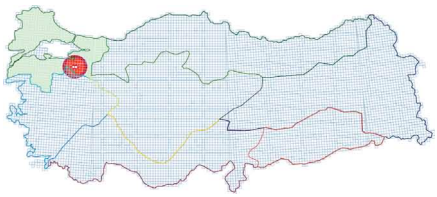
Province (District)
Kırklareli (Tekirdağ, Lüleburgaz, Hayrabolu)

Square code & Central coordinates
NF27 27°17'53.52 E, 41°19'28.20 N

Altitudinal range of records
-

Number of priority species
1

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Apatura metis								•



PBA no. **Name**

MA04 Uludağ

Province (District)
Bursa (Osmangazi, Nilüfer, Kestel)

Square codes & Central coordinates
PE74 29°03'12.96 E, 40°08'07.80 N
PE84 29°10'15.24 E, 40°08'00.24 N

Altitudinal range of records
450–2,400 m

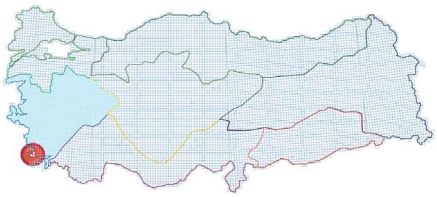
Number of priority species
9

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Zerynthia cerisy								
Zerynthia polyxena								•
Archon apollinus								
Parnassius mnemosyne								•
Lycaena dispar						•		•
Aricia hyacinthus	•					•		
Aricia anteros								
Polyommatus cornelia	•							
Erebia ottomana						•		

©Onat Başbay

Swallowtail
(*Papilio machaon*)

Aegean



PBA no. **Name**

EG01 Bodrum-Gökova

Province (District)
Muğla (Bodrum)

Square codes & Central coordinates
NA39 27°23'34.08 E, 36°59'56.04 N
NA49 27°30'18.72 E, 36°59'54.60 N
NB40 27°30'20.88 E, 37°05'18.96 N

Altitudinal range of records
0–159 m

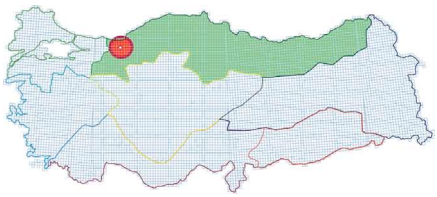
Number of priority species
3

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Zerynthia cerisy								
Hipparchia mersina		•						
Maniola halicarnassus		•		•				

©Tamer Arda

Caucasian Festoon
(*Zerynthia caucasica*)

Black Sea



Square code & central coordinates
UL42 31°09'37.80 E, 40°51'35.28 N

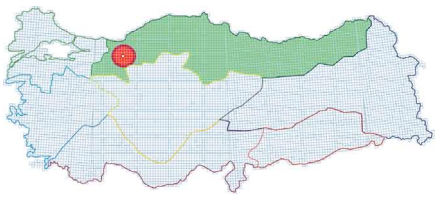
Altitudinal range of records
800–1,000 m

Number of priority species
2

PBA no. **Name**
KA01 Düzce

Province (District)
Düzce (Düzce, Çılımlı)

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Zerynthia caucasica					•			
Zerynthia polyxena								•



Square code & central coordinates
UK59 31°17'09.96 E, 40°35'29.40 N

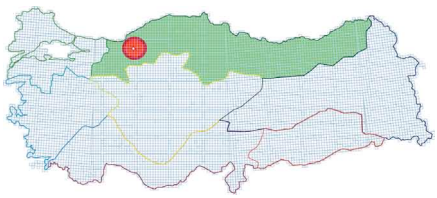
Altitudinal range of records
1,000–1,700 m

Number of priority species
6

PBA no. **Name**
KA02 Abant Lake

Province (District)
Bolu (Murdurnu) : Düzce (Düzce, Kaynaşlı)

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Zerynthia caucasica					•			
Zerynthia polyxena								•
Parnassius mnemosyne								•
Tomares nogelii								
Aricia anteros								
Euphydryas aurinia								•



Square code & central coordinates
UL92 31°45'12.96 E, 40°52'03.72 N

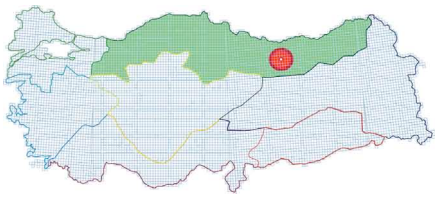
Altitudinal range of records
1,000–1,700 m

Number of priority species
3

PBA no. **Name**
KA03 Bolu Mountains

Province (District)
Bolu (Bolu, Mengen) : Düzce (Yığılca)

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Zerynthia caucasica					•			
Zerynthia polyxena								•
Parnassius mnemosyne								•



PBA no. **Name**

KA04 Şebinkarahisar

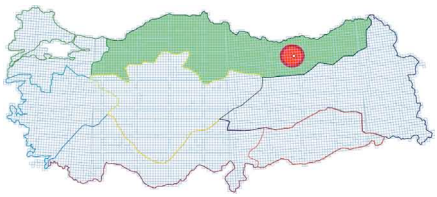
Province (District)
Giresun (Şebinkarahisar)

Square code & central coordinates
DE56 39°28'12.00 E, 40°19'57.72 N

Altitudinal range of records
1,300–1,670 m

Number of priority species
4

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Pseudophilotes bavius								•
Aricia torulensis	•			•				
Aricia anteros								
Polyommatus sigberti	•						•	



PBA no. **Name**

KA05 Artabel Lakes

Province (District)
Giresun (Alucra) : Gümüşhane (Torul, Kürtün)

Square code & central coordinates
EE07 39°03'31.32 E, 40°25'26.40 N

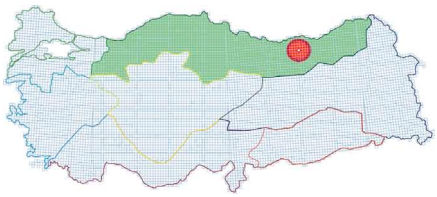
Altitudinal range of records
1,965–2,300 m

Number of priority species
3

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Boloria caucasica		•						
Erebia melancholica		•				•		
Erebia ottomana						•		

©Evrim Karaçetin

Alpine ringlet
(*Erebia melancholica*)



PBA no. **Name**

KA06 Zigana Pass

Province (District)
Gümüşhane (Torul)

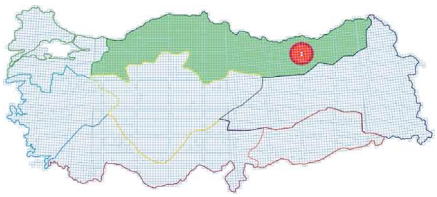
Square code & central coordinates
EE29 39°17'42.72 E, 40°36'13.68 N

Altitudinal range of records
900–2,000 m

Number of priority species
6

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Phengaris arion								•
Aricia anteros								
Boloria caucasica		•						
Erebia hewitsonii		•						
Erebia melancholica		•				•		
Erebia ottomana						•		

Karaçetin, E., H.J. Welch, A. Turak, Ö. Balkız and G. Welch. 2011. Conservation Strategy for Butterflies in Turkey. Ankara: Doğa Koruma Merkezi. *Available from:* [www.dkm.org.tr]



Square codes & central coordinates
EE37 39°24'44.28 E, 40°25'23.88 N
EE38 39°24'46.44 E, 40°30'48.24 N

Altitudinal range of records
1,100–1,650 m

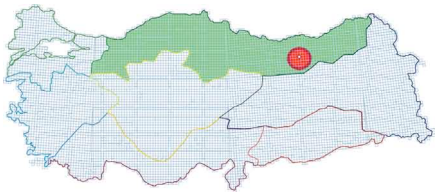
Number of priority species
4

PBA no. **Name**

KA07 Gümüşhane

Province (District)
Gümüşhane (Gümüşhane, Torul)

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Parnassius apollo								•
Aricia torulensis	•			•				
Aricia anteros								
Polyommatus poseidon	•							



Square code & central coordinates
EE26 39°17'38.76 E, 40°20'00.96 N

Altitudinal range of records
1,500–1,800 m

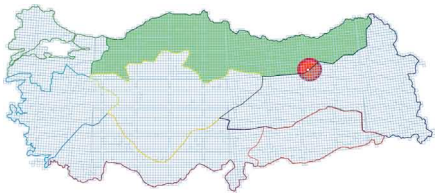
Number of priority species
5

PBA no. **Name**

KA08 Tersundağı Pass

Province (District)
Gümüşhane (Gümüşhane, Torul, Sıran)

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Parnassius apollo								•
Aricia anteros								
Polyommatus bilgini	•						*	
Polyommatus poseidon	•							
Polyommatus wagneri	•						•	



Square code & central coordinates
EE51 39°38'34.80 E, 39°52'54.12 N

Altitudinal range of records
2,100–2,400 m

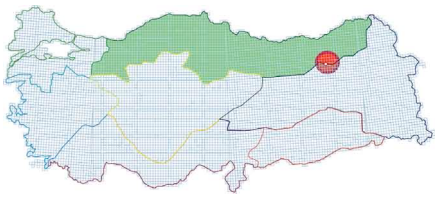
Number of priority species
9

PBA no. **Name**

KA09 Sipikör Pass

Province (District)
Erzincan (Çayırlı, Erzincan) : Gümüşhane (Kelkit)

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Polyommatus eros								•
Polyommatus bilgini	•						•	
Polyommatus poseidon	•							
Polyommatus wagneri	•							•
Polyommatus tankeri	•			•				
Polyommatus ninae		•						
Polyommatus turcicus		•						
Polyommatus erzindjanensis	•						•	
Satyrus parthicus						•		



PBA no. **Name**

KA10 Kop Mountain

Province (District)
Bayburt (Bayburt) : Erzurum (Aşkale)

Square code & central coordinates
FE23 40°27'55.08 E, 40°03'15.84 N

Altitudinal range of records
1,750–2,900 m

Number of priority species
18

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Parnassius mnemosyne								•
Parnassius apollo								•
Papilio alexanor								•
Pieris bowdeni		•					•	
Phengaris arion								•
Phengaris nausithous				•				•
Pseudophilotes bavius								•
Polyommatus diana		•		•				
Polyommatus myrrha		•						
Polyommatus eros								•
Polyommatus menalcas	•							
Polyommatus hopfferi	•							
Polyommatus wagneri	•						•	
Polyommatus tankeri	•			•				
Polyommatus turcicus		•						
Euphydryas aurinia								•
Erebia graucasica		•						
Satyrus parthicus						•		

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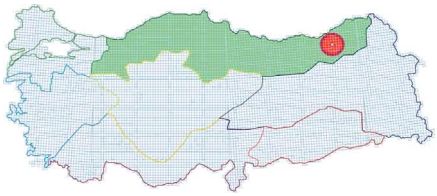
Gavarnie blue and false heath fritillary
(*Plebejus dardanus* and *Melitaea diamina*)



PBA no. **Name**

KA11 Ovit Mountain

Province (District)
Erzurum (İspir) : Rize (İkizdere)

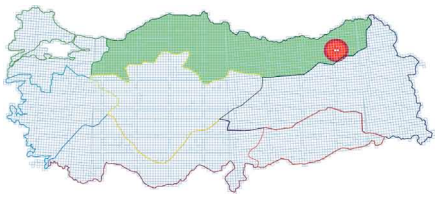
Square code & central coordinates
FF50 49°50'02.04 E, 40°40'46.92 N

Altitudinal range of records
2,800–3,170 m

Number of priority species
6

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Parnassius apollo								•
Pieris bowdeni		•					•	
Boloria caucasica		•						
Erebia graucasica		•						
Erebia hewitsonii		•						
Erebia melancholica		•				•		

Karaçetin, E., H.J. Welch, A. Turak, Ö. Balkız and G. Welch. 2011. Conservation Strategy for Butterflies in Turkey. Ankara: Doğa Koruma Merkezi. *Available from:* [www.dkm.org.tr]



PBA no. KA12 **Name** İspir

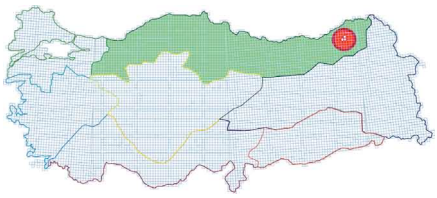
Province (District)
Ezurum (İspir)

Square codes & central coordinates
FE68 40°56'48.84 E, 40°29'51.72 N
FE78 41°03'53.28 E, 40°29'44.52 N

Altitudinal range of records
1,300–2,000 m

Number of priority species
19

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Parnassius mnemosyne								•
Parnassius apollo								•
Papilio alexanor								•
Lycaena euphratica		•					•	
Phegaris arion								•
Scolitantides orion						•		
Aricia teberdina				•				
Polyommatus antidolus	•						•	
Polyommatus menalcas	•							
Polyommatus hopfferi	•							
Polyommatus wagneri	•						•	
Polyommatus tankeri	•			•				
Polyommatus ninae		•						
Polyommatus turcicus		•						
Polyommatus merhaba	•			•				
Euphydryas aurinia								•
Erebia hewitsonii		•						
Erebia melancholica		•				•		
Hyponephele urartua	•				•			



PBA no. KA13 **Name** South Kaçkars

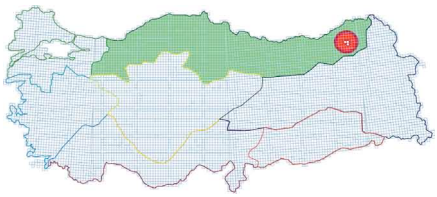
Province (District)
Artvin (Yusufeli)

Square codes & central coordinates
FF92 41°18'47.16 E, 40°51'04.68 N
GF02 41°25'53.76 E, 40°50'55.68 N
GF03 41°26'05.64 E, 40°56'19.68 N

Altitudinal range of records
750–2,500 m

Number of priority species
14

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Parnassius mnemosyne								•
Parnassius apollo								•
Colius caucasica				•				
Phengaris arion								•
Pseudophilotes bavius								•
Polyommatus eros								•
Polyommatus ninae		•						
Polyommatus turcicus		•						
Boloria caucasica		•						
Melitaea aurelia						•		
Euphydryas aurinia								•
Erebia graucasica		•						
Erebia melancholica		•				•		
Coenonympha symphyta		•				•		



PBA no. **Name**

KA14 Çoruh Valley

Province (District)
Artvin (Yusufeli) : Erzurum (Uzundere)

Square codes & central coordinates
GF01 41°25'41.88 E, 40°45'31.68 N
GF10 41°32'35.88 E, 40°39'58.68 N
GF11 41°32'48.12 , 40°45'22.68 N

Altitudinal range of records
671–1,972 m

Number of priority species
11

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Satyrium hyrcanicum				•				
Phengaris nausithous				•				•
Scolitantides orion						•		
Polyommatus artivinensis	•				•			
Polyommatus mithridates	•							•
Polyommatus hopfferi	•							
Polyommatus poseidon	•							
Polyommatus wagneri	•						•	
Polyommatus ninae		•						
Polyommatus merhaba	•			•				
Euphydryas aurinia								•

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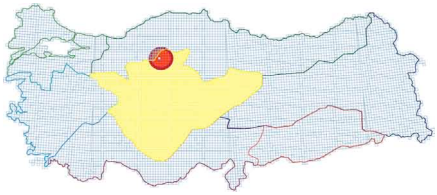
Steppe fritillary
(*Euphydryas orientalis*)

Central Anatolia



PBA no. **Name**

OA01 Karagöl

Province (District)
Ankara (Çubuk)

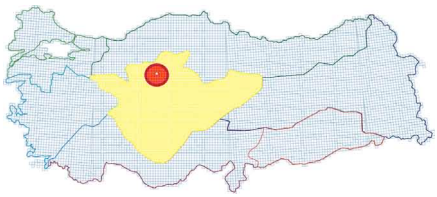
Square code & central coordinates
VK97 32°56'26.16 E, 40°25'26.40 N

Altitudinal range of records
1,100–1,300 m

Number of priority species
5

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Parnassius mnemosyne								•
Tomares nogelii								
Aricia anteros								
Euphydryas aurinia								*
Euphydryas orientalis				•				

Karaçetin, E., H.J. Welch, A. Turak, Ö. Balkız and G. Welch. 2011. Conservation Strategy for Butterflies in Turkey. Ankara: Doğa Koruma Merkezi. *Available from:* [www.dkm.org.tr]



PBA no. **Name**

OA02 Middle East Technical University Campus

Province (District)
Ankara (Yenimahalle, Keçiören, Altındağ)

Square code & central coordinates
VK81 32°49'27.12 E, 39°52'59.88 N

Altitudinal range of records
800–1,200 m

Number of priority species
7

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Archon apollinus								
Zegris eupheme						•		
Tomares nogelii								
Pseudophilotes bavius								•
Polyommatus cornelia	•							
Polyommatus menalcas	•							
Euphydryas orientalis				•				

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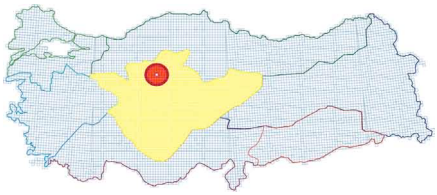
Anatolian vernal copper
(*Tomares nogelii*)



PBA no. **Name**

OA03 Ankara

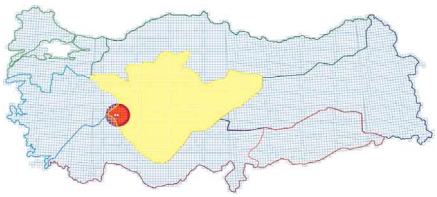
Province (District)
Ankara (Çankaya, Mamak)

Square code & central coordinates
VK82 32°49'26.04 E, 39°58'24.24 N

Altitudinal range of records
800–1,200 m

Number of priority species
11

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Archon apollinus								
Papilio alexanor								•
Zegris eupheme						•		
Pseudophilotes bavius								•
Polyommatus ossmar	•							
Polyommatus cornelia	•							
Polyommatus myrrha		•						
Polyommatus menalcas	•							
Polyommatus wagneri	•						•	
Euphdryas aurinia								•
Euphydryas orientalis				•				



PBA no. **Name**

OA04 Sultan Mountains

Province (District)
Afyon (Çay, Sultandağı) : Isparta (Yalvaç)

Square codes & central coordinates
UH26 30°59'32.65 E, 38°30'52.56 N
UH36 31°06'25.20 E, 38°30'59.40 N

Altitudinal range of records
1,200–2,000 m

Number of priority species
12

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Parnassius apollo								•
Papilio alexanor								•
Turanana taygetica								
Aricia hyacinthus	•					•		
Aricia anteros								
Polyommatus ossmar	•							
Polyommatus cornelia	•							
Polyommatus sigberti	•						•	
Polyommatus menalcas	•							
Polyommatus hopfferi	•							
Polyommatus wagneri	•						•	
Pseudochazara lydia	•							

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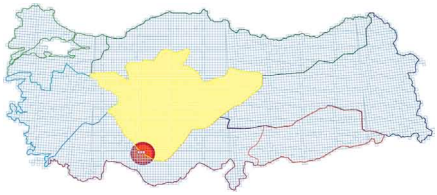
Southern swallowtail
(*Papilio alexanor*)



PBA no. **Name**

OA05 Geyik Mountains

Province (District)
Konya (Ahırlı, Akseki) : Antalya (Bozkır)

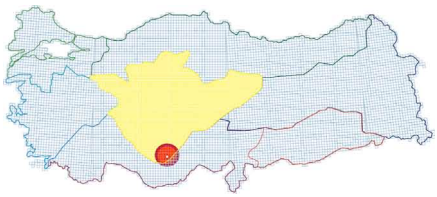
Square codes & central coordinates
VG11 32°02'31.56 E, 37°10'33.60 N
VG21 32°09'16.92 E, 37°10'36.48 N
VG31 32°16'02.64 E, 37°10'39.35 N

Altitudinal range of records
1,100–1,350 m

Number of priority species
1

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Polyommatus guezelmavi	•					•		

Karaçetin, E., H.J. Welch, A. Turak, Ö. Balkız and G. Welch. 2011. Conservation Strategy for Butterflies in Turkey. Ankara: Doğa Koruma Merkezi. *Available from:* [www.dkm.org.tr]



PBA no. **Name**

OA06 South Karaman

Province (District)
Karaman (Karaman)

Square code & central coordinates
WG20 33°16'51.24 E, 37°05'21.84 N

Altitudinal range of records
1,100–1,900 m

Number of priority species
13

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Papilio alexanor								•
Glaucopsyche astraea	•							
Pseudophilotes bavius								•
Polyommatus ossmar	•							
Polyommatus cornelia	•							
Polyommatus sertavulensis	•						•	
Polyommatus menalcas	•							
Polyommatus mithridates	•						•	
Polyommatus hopfferi	•							
Polyommatus poseidon	•							
Polyommatus wagneri	•						•	
Hipparchia mersina		•						
Pseudochazara lydia	•							

©Hilary & Geoff Welch

Turkish furry blue
(*Polyommatus menalcas*)

PBA no. **Name**

OA07 Sertavul Pass

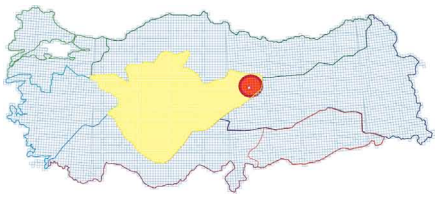
Province (District)
Mersin [*was İçel*] (Mut) : Karaman (Karaman)

Square code & central coordinates
WF28 33°16'48.72 E, 36°54'32.76 N

Altitudinal range of records
700–1,650 m

Number of priority species
10

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Glaucopsyche astraea	•							
Turanana taygetica								
Polyommatus ossmar	•							
Polyommatus cornelia	•							
Polyommatus cilicius	•						•	
Polyommatus sertavulensis	•						•	
Polyommatus menalcas	•							
Polyommatus wagneri	•						•	
Hipparchia mersina		•						
Pseudochazara lydia	•							



PBA no. **Name**

OA08 Kurtlukaya

Province (District)
Sivas (Ulaş, Altınyayla)

Square code & central coordinates
CD26 36°58'00.84 E, 39°24'54.72 N

Altitudinal range of records
1,475–1,535 m

Number of priority species
2

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Polyommatus menalcas	•							
Hyponephele naricoides	•							

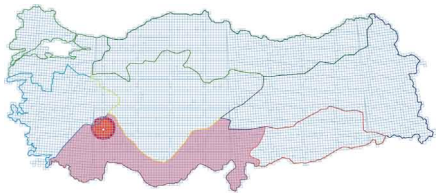
©Hilary & Geoff Welch

Tessellated skipper
(*Muschampia tessellum*)

©Onat Başbay

Little tiger blue
(*Tarucus balkanicus*)

Mediterranean



PBA no. **Name**

AK01 Güneykent

Province (District)
Isparta (Gönen, Uluborlu, Keçiborlu)

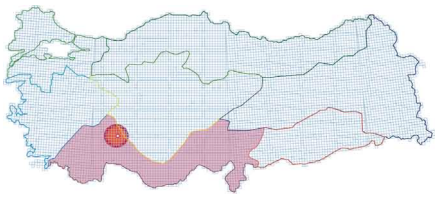
Square code & central coordinates
TH70 30°26'18.24 E, 37°57'47.52 N

Altitudinal range of records
-

Number of priority species
1

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Polyommatus lycius	•				•			

Karaçetin, E., H.J. Welch, A. Turak, Ö. Balkız and G. Welch. 2011. Conservation Strategy for Butterflies in Turkey. Ankara: Doğa Koruma Merkezi. *Available from:* [www.dkm.org.tr]



PBA no. **Name**

AK02 Aksu

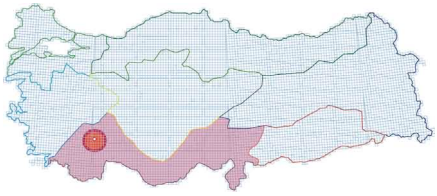
Province (District)
Isparta (Aksu, Eğirdir)

Square code & central coordinates
UG38 31°07'32.16 E, 37°47'45.24 N

Altitudinal range of records
1,200–2,100 m

Number of priority species
6

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Zerynthia cerisy								
Archon apollinus								
Polyommatus ossmar	•							
Polyommatus sertavulensis	•						•	
Polyommatus wagneri	•						•	
Polyommatus iphicarmon	•				•			



PBA no. **Name**

AK03 Yassıgüme

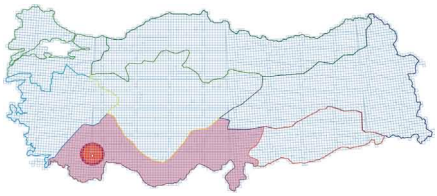
Province (District)
Burdur (Burdur)

Square code & central coordinates
TG46 30°06'40.68 E, 37°35'42.72 N

Altitudinal range of records
-

Number of priority species
1

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Callophrys herculeana	•						•	



PBA no. **Name**

AK04 Korkuteli

Province (District)
Antalya (Korkuteli)

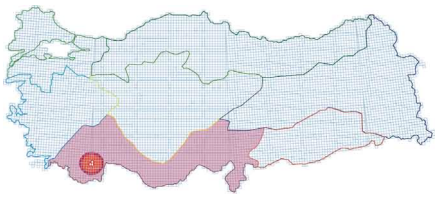
Square code & central coordinates
TG30 30°02'15.72 E, 37°03'08.64 N

Altitudinal range of records
1,600–1,700 m

Number of priority species
1

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Polyommatus schuriani	•						•	

African ringlet
(*Ypthima asterope*)



PBA no. **Name**

AK05 Elmalı-Gölova

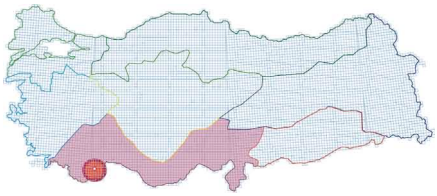
Province (District)
Antalya (Elmalı, Korkuteli)

Square codes & central coordinates
QA67 29°57′22.68 E, 36°46′55.92 N
TF37 30°02′34.08 E, 36°46′55.92 N
TF38 30°02′27.96 E, 36°52′20.28 N

Altitudinal range of records
1,250–1,600 m

Number of priority species
4

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Polyommatus menalcas	•							
Polyommatus lycius	•				•			
Polyommatus schuriani	•						•	
Psuedochazara lydia	•							



PBA no. **Name**

AK06 South Beydağlar

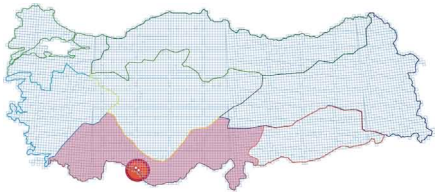
Province (District)
Antalya (Kumluca, Elmalı, Finike)

Square code & central coordinates
TF45 30°08′55.32 E, 36°36′17.64 N

Altitudinal range of records
1,800–2,950 m

Number of priority species
2

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Polyommatus menalcas	•							
Hyponephele kocaki		•					•	



PBA no. **Name**

AK07 Alanya and North

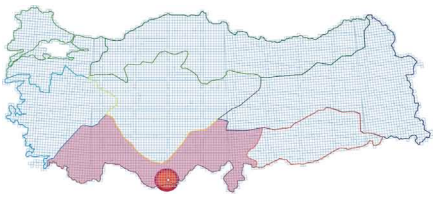
Province (District)
Antalya (Alanya, Gündoğmuş)

Square codes & central coordinates
VF05 31°56′13.20 E, 36°38′03.12 N
VF14 32°02′59.64 E, 36°32′42.00 N

Altitudinal range of records
0–600 m

Number of priority species
7

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Zerynthia cerisy								
Archon apollinus								
Papilio alexanor								•
Lycaena ottomana					•			
Pseudophilotes bavius								•
Polyommatus cornelia	•							
Maniola megala		•						



PBA no. **Name**

AK08 Gülnar

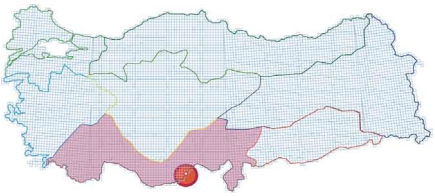
Province (District)
Mersin [İçel] (Gülpınar, Aydıncık)

Square code & central coordinates
WF31 33°23'21.48 E, 36°16'39.72 N

Altitudinal range of records
600–650 m

Number of priority species
2

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Zerynthia cerisy								
Melanargia wiskotti	•				•			



PBA no. **Name**

AK09 Limonlu Basin

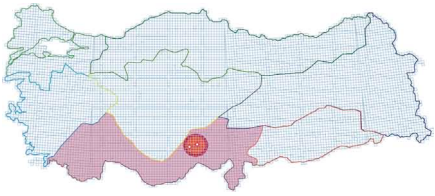
Province (District)
Mersin [İçel] (Erdemli, Silifke)

Square code & central coordinates
XF03 34°10'16.68 E, 36°27'10.44 N

Altitudinal range of records
0–50 m

Number of priority species
3

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Zerynthia cerisy								
Archon apollinus								
Melanargia wiskotti	•				•			



PBA no. **Name**

AK10 Bolkar Mountains

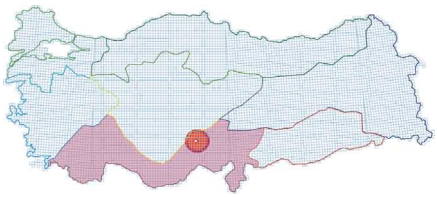
İProvince (District)
Konya (Halkapınar) : Mersin [İçel] (Tarsus) : Niğde (Ulukışla)

Square codes & central coordinates
XG13 34°17'53.16 E, 37°21'10.80 N
XG44 34°38'19.32 E, 37°26'20.04 N

Altitudinal range of records
1,300–3,150 m

Number of priority species
6

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Polyommatus cornelia	•							
Polyommatus eros								•
Polyommatus cilicius	•						•	
Polyommatus sertavulensis	•						•	
Psuedochazara lydia	•							
Pyrgus bolkarienis	•						•	



Square code & central coordinates
XG36 34°31'45.48 E, 37°37'14.16 N

Altitudinal range of records
1,400–2,200 m

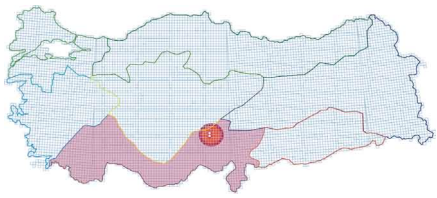
Number of priority species
4

PBA no. **Name**

AK11 Çaykavak Pass

Province (District)
Niğde (Ulukışla)

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Archon apollinus								
Polyommatus cilicius	•						•	
Polyommatus poseidon	•							
Polyommatus wagneri	•						•	



Square codes & central coordinates
XG88 35°06'02.52 E, 37°47'31.56 N
XG89 35°06'11.52 E, 37°52'55.56 N

Altitudinal range of records
1,200–3,100 m

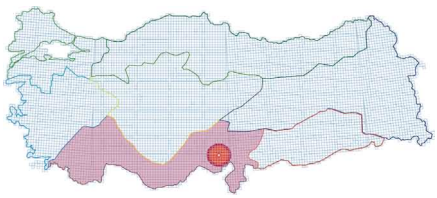
Number of priority species
15

PBA no. **Name**

AK12 Aladağlar

Province (District)
Niğde (Çamardı) : Kayseri (Yahyalı)

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Archon apollinus								
Parnassius mnemosyne								•
Parnassius apollo								•
Glaucopsyche astraea	•							
Aricia anteros								
Pseudophilotes bavius								•
Polyommatus ossmar	•							
Polyommatus syriacus								
Polyommatus cornelia	•							
Polyommatus actis	•						•	
Polyommatus sigberti	•						•	
Polyommatus mithridates	•						•	
Polyommatus poseidon	•							
Polyommatus wagneri	•						•	
Pyrgus aladaghensis	•						•	



Square code & central coordinates
YG21 35°31'59.52 E, 37°09'10.08 N

Altitudinal range of records
50–50 m

Number of priority species
3

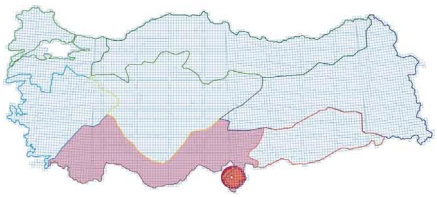
PBA no. Name

AK13 Northeast Adana

Province (District)
Adana (Yüreğir, Ceyhan)

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Melanargia wiskotti	•				•			
Hipparchia mersina		•						
Maniola megala		•						

Karaçetin, E., H.J. Welch, A. Turak, Ö. Balkız and G. Welch. 2011. Conservation Strategy for Butterflies in Turkey. Ankara: Doğa Koruma Merkezi. *Available from:* [www.dkm.org.tr]



PBA no. **Name**

AK14 South Amanos Mountains

Province (District)
Hatay (Hatay, İskenderun)

Square code & central coordinates
BA32 36°03'05.04 E, 36°19'54.84 N

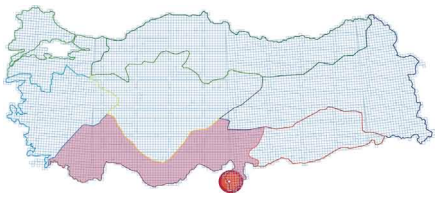
Altitudinal range of records
1,400–1,600 m

Number of priority species
1

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Polyommatus bollandi	•		•					

©Ali Atahan

Bolland's blue
(*Polyommatus bollandi*)



PBA no. **Name**

AK15 Samandağ

Province (District)
Hatay (Samandağ)

Square code & central coordinates
YF60 35°56'40.56 E, 36°09'06.48 N

Altitudinal range of records
0–300 m

Number of priority species
2

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Zerynthia cerisy								
Archon apollinus								

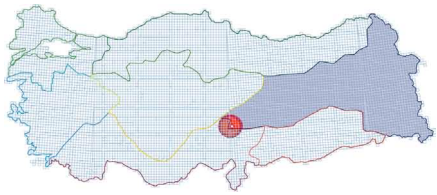
©Özge Balkız

Brown argus
(*Aricia agestis*)

©Oktay Subaşı

Wagner's steppe brown
(*Hyponephele wagneri*)

Eastern Anatolia



PBA no. **Name**
DA01 North Saimbeyli

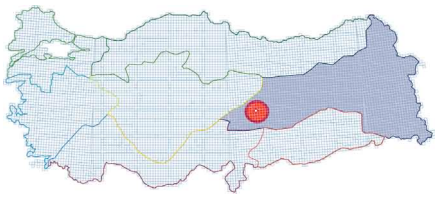
Province (District)
Adana (Saimbeyli)

Square code & central coordinates
BC41 36°05'38.04 E, 38°02'43.08 N

Altitudinal range of records
900–2,200 m

Number of priority species
13

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Parnassius mnemosyne								•
Parnassius apollo								•
Tomares nogelii								
Pseudophilotes bavius								•
Polyommatus ossmar	•							
Polyommatus syriacus								
Polyommatus cornelia	•							
Polyommatus menalcas	•							
Polyommatus poseidon	•							
Polyommatus theresiae	•			•				
Polyommatus wagneri	•						•	
Hipparchia mersina		•						
Psuedochazara lydia	•							



PBA no. **Name**
DA02 Gökpınar

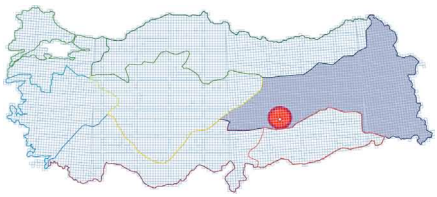
Province (District)
Sivas (Gürün) : Kahramanmaraş (Elbistan)

Square code & central coordinates
CC47 37°13'10.56 E, 38°36'30.24 N

Altitudinal range of records
1,500–1,700 m

Number of priority species
10

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Papilio alexanor								•
Glaucopsyche astraea	•							
Pseudophilotes bavius								•
Polyommatus ossmar	•							
Polyommatus menalcas	•							
Polyommatus mithridates	•						•	
Polyommatus hopfferi	•							
Polyommatus poseidon	•							
Polyommatus wagneri	•						•	
Hyponephele naricoides	•							



PBA no. **Name**

DA03 Yeşilyurt

Province (District)
Malatya (Yeşilyurt, Malatya)

Square code & central coordinates
DC33 38°15'24.48 E, 38°15'32.76 N

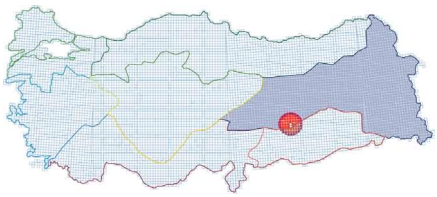
Altitudinal range of records
900–1,532 m

Number of priority species
3

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Polyommatus mithridates	•						•	
Polyommatus dama	•			•				
Polyommatus hopfferi	•							

©Süleyman Ekşioğlu

Mud-puddling blues in Yeşilyurt. *left to right*: **Mesopotamian blue** (*Polyommatus dama*) – one of the largest blues in Turkey, endemic and Endangered; **small Anatolian blue** (*Polyommatus cornelia*) – endemic and Least Concern; **jewel blue** (*Chilades trochylus*) – the smallest blue in Turkey, Least Concern.



PBA no. **Name**

DA04 Nemrut Mountain

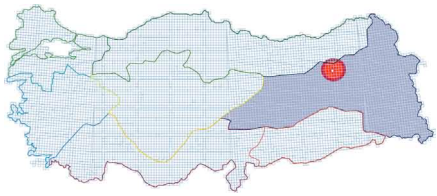
Province (District)
Adıyaman (Kahta, Sıncık) : Malatya (Pötürge)

Square codes & central coordinates
DC70 38°42'54.00 E, 37°59'26.52 N
DC71 38°42'52.92 E, 38°04'51.24 N

Altitudinal range of records
400–2,250 m

Number of priority species
6

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Zerynthia cerisy								
Papilio alexanor								•
Lycaena euphratica		•					•	
Polyommatus cornelia	•							
Polyommatus dama	•			•				
Chazara egina	•							



PBA no. **Name**

DA05 South Aşkale

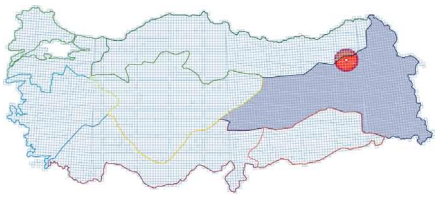
Province (District)
Erzurum (Aşkale)

Square code & central coordinates
FE40 40°41'34.80 E, 39°46'51.60 N

Altitudinal range of records
-

Number of priority species
1

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Polyommatus interjectus	•						•	



Square code & central coordinates
GE04 41°24'20.52 E, 40°07'43.68 N

Altitudinal range of records
1,900–2,200 m

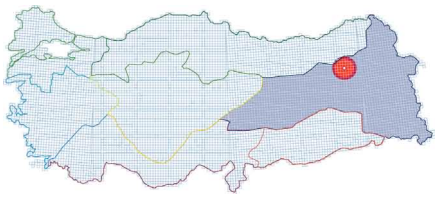
Number of priority species
8

PBA no. **Name**

DA06 Dumlu

Province (District)
Erzurum (Erzurum)

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Phengaris arion								•
Phengaris nausithous				•				•
Polyommatus diana		•		•				
Polyommatus eros								•
Polyommatus wagneri	•						•	
Polyommatus anticarmon	•						•	
Polyommatus ninae		•						
Polyommatus turcicus		•						



Square code & central coordinates
FE91 41°16'46.20 E, 39°51'39.96 N

Altitudinal range of records
1,400–3,200 m

Number of priority species
16

PBA no. **Name**

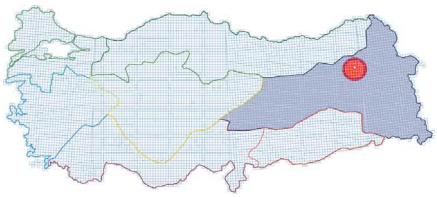
DA07 Palandöken Mountains

Province (District)
Erzurum (Erzurum)

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Parnassius apollo								•
Pieris bowdeni		•					•	
Zegris eupheme						•		
Phengaris arion								•
Polyommatus eros								•
Polyommatus menalcas	•							
Polyommatus wagneri	•						•	
Polyommatus tankeri	•			•				
Polyommatus ninae		•						
Polyommatus turcicus		•						
Boloria graeca			•					
Melitaea aurelia						•		
Euphydryas aurinia								•
Satyrus parthicus						•		
Coenonympha symphyta		•				•		
Pyrgus cirsii							•	

©Erim Karaetin

Apollo
(*Parnassius apollo*)



Square code & central coordinates
GE31 41°44'47.76 E, 39°51'03.24 N

Altitudinal range of records
1,850–1,850 m

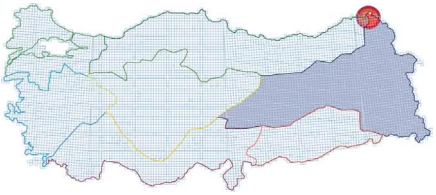
Number of priority species
1

PBA no. **Name**

DA08 Taşlıyurt

Province (District)
Erzurum (Pasinler, Karayazı)

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Polyommatus putnami	•						•	



Square code & central coordinates
LM10 42°46'51.24 E, 41°43'25.32 N

Kayıtların yükseklik aralığı
1,600–1,850 m

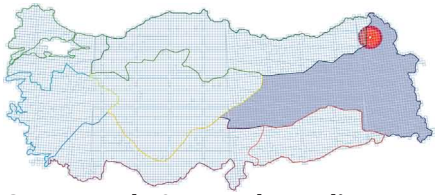
Number of priority species
1

PBA no. **Name**

DA09 Posof

Province (District)
Ardahan (Posof)

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Phengaris arion								•



Square code & central coordinates
KL91 42°34'16.68 E, 40°45'31.68 N

Altitudinal range of records
1,900–2,200 m

Number of priority species
7

PBA no. **Name**

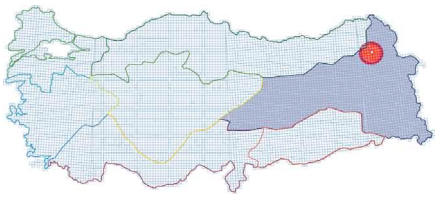
DA10 Göle

Province (District)
Ardahan (Göle) : Erzurum (Şenkaya)

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Parnassius apollo								•
Phengaris arion								•
Polyommatus myrrha		•						
Polyommatus menalcas	•							
Polyommatus wagneri	•						•	
Polyommatus turcicus		•						
Coenonympha symphyta		•				•		

©Hilary & Geoff Welch

Lederer's heath
(*Coenonympha symphyta*)



Square code & central coordinates
KK96 42°35'15.00 E, 40°18'31.68 N

Altitudinal range of records
1,950–2,300 m

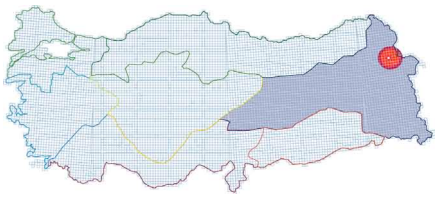
Number of priority species
10

PBA no. **Name**

DA11 Sarıkamış

Province (District)
Kars (Sarıkamış)

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Parnassius mnemosyne								•
Parnassius apollo								•
Papilio alexanor								•
Zegris eupheme						•		
Phengaris nausithous				•				•
Polyommatus diana		•		•				
Polyommatus ninae		•						
Euphydryas aurinia								•
Coenonympha symphyta		•				•		
Pyrgus cirsii							•	



Square code & central coordinates
LK53 43°17'60.00 E, 40°03'04.32 N

Altitudinal range of records
1,300–3,000 m

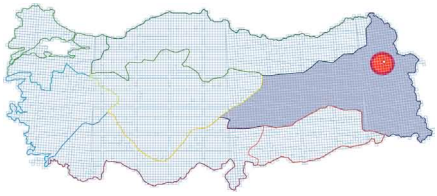
Number of priority species
4

PBA no. **Name**

DA12 Duranlar

Province (District)
Kars (Kağızman) : Iğdır (Tuzluca) : Ağrı (Ağrı)

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Zegris eupheme						•		
Satyrium hyrcanicum				•				
Polyommatus ninae		•						
Melitaea aurelia						•		



Square code & central coordinates
LK31 43°04'14.52 E, 39°52'02.64 N

Altitudinal range of records
-

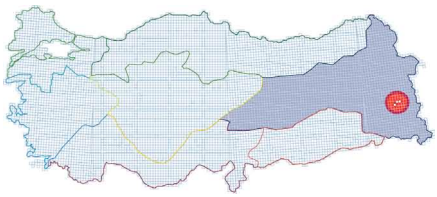
Number of priority species
2

PBA no. **Name**

DA13 North Ağrı

Province (District)
Ağrı (Ağrı)

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Polyommatus ninae		•						
Polyommatus putnami	•						•	



PBA no. **Name**

DA14 Erek Mountain

Province (District)
Van (Edremit, Van)

Square codes & central coordinates
LH55 43°20'19.32 E, 38°25'47.64 N
LH66 43°27'04.68 E, 38°31.17.76 N
LH76 43°33'57.60 E, 38°31'23.16 N

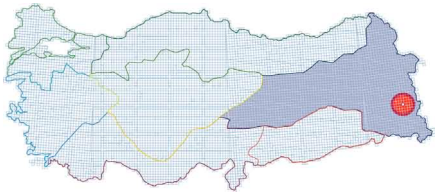
Altitudinal range of records
1,800–2,300 m

Number of priority species
17

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Parnassius mnemosyne								•
Papilio alexanor								•
Zegris eupheme						•		
Callophrys mystaphia		•		•				
Phengaris arion								•
Pseudophilotes bavius								•
Plebejus rosei		•	•					
Polyommatus haigi	•						•	
Polyommatus dantchenkoi	•						•	
Polyommatus kurdistanicus	•						•	
Polymmatus menalcas	•							
Polyommatus wagneri	•						•	
Polyommatus baytopi		•						
Polyommatus ninae		•						
Polyommatus turcicus		•						
Hyponephele kocaki		•					•	
Hyponephele naricoides	•							

©Hilary & Geoff Welch

Marsh fritillary
(*Euphydryas aurinia*)



PBA no. **Name**

DA15 Güzelsu

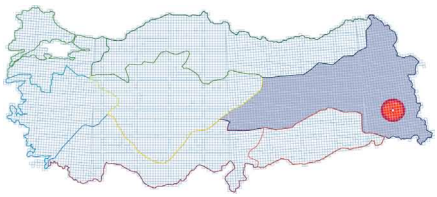
Province (District)
Van (Gürpınar)

Square code & central coordinates
LH84 43°41'02.40 E, 38°20'39.12 N

Altitudinal range of records
1,900–2,400 m

Number of priority species
4

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Polyommatus baytopi		•						
Polyommatus ninae		•						
Polyommatus pierceae	•						•	
Hyponephele naricoides	•							



PBA no. **Name**

DA16 Artos Mountain

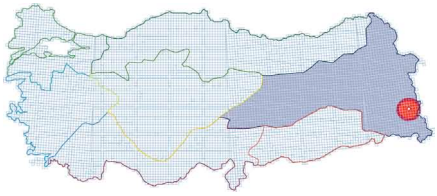
Province (District)
Van (Çatak, Gevaş)

Square code & central coordinates
LH43 43°13'42.96 E, 38°14'53.16 N

Altitudinal range of records
1,800–2,400 m

Number of priority species
18

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Parnassius mnemosyne								•
Papilio alexanor								•
Zegris eupheme						•		
Phengaris arion								•
Pseudophilotes bavius								•
Polyommatus buzulmavi	•						•	
Polyommatus haigi	•						•	
Polyommatus dantchenkoi	•						•	
Polyommatus kurdistanicus	•						•	
Polyommatus hopfferi	•							
Polyommatus wagneri	•						•	
Polyommatus baytopi		•						
Polyommatus anticarmon	•						•	
Polyommatus ninae		•						
Polyommatus turcicus		•						
Chazara egina	•							
Satyrus parthicus						•		
Hyponephele naricoides	•							



PBA no. **Name**

DA17 Güzeldere Pass

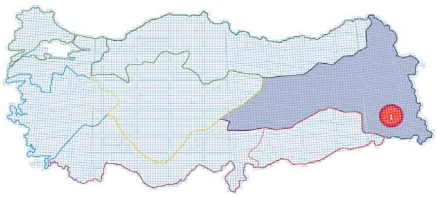
Province (District)
Van (Gürpınar, Başkale)

Square code & central coordinates
MH02 43°54'55.44 E, 38°09'58.68 N

Altitudinal range of records
2,000–3,400 m

Number of priority species
14

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Parnassius mnemosyne								•
Pieris bowdeni		•					•	
Zegris eupheme						•		
Lycaena euphratica		•					•	
Polyommatus fatima		•						
Polyommatus haigi	•						•	
Polyommatus mithridates	•						•	
Polyommatus wagneri	•						•	
Polyommatus baytopi		•						
Polyommatus pierceae	•						•	
Polyommatus turcicus		•						
Satyrus parthicus						•		
Hyponephele kocaki		•					•	
Hyponephele naricoides	•							



PBA no. **Name**

DA18 Çatak Valley

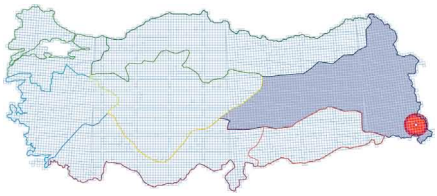
Province (District)
Van (Çatak)

Square codes & central coordinates
LH30 43°07'16.68 E, 37°58'33.96 N
LH31 43°07'08.40 E, 38°03'58.32 N

Altitudinal range of records
1,500–2,500 m

Number of priority species
20

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Parnassius mnemosyne								•
Papilio alexanor								•
Zegris eupheme						•		
Lycaena euphratica		•					•	
Pseudophilotes bavius								•
Polyommatus buzulmavi	•						•	
Polyommatus fatima		•						
Polyommatus dantchenkoi	•						•	
Polyommatus kurdistanicus	•						•	
Polyommatus hopfferi	•							
Polyommatus wagneri	•						•	
Polyommatus baytopi		•						
Polyommatus ninae		•						
Polyommatus pierceae	•						•	
Polyommatus turcicus		•						
Brenthis mofidii								
Euphydryas aurinia								•
Chazara egina	•							
Satyrus parthicus						•		
Pyrgus cirsii							•	



PBA no. **Name**

DA19 Yüksekova

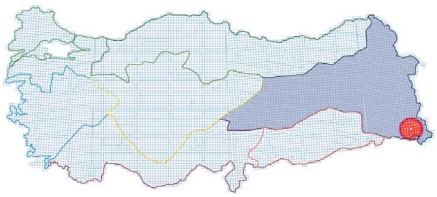
Province (District)
Hakkari (Yüksekova)

Square code & central coordinates
MG26 44°08'60.00 E, 37°37'39.00 N

Altitudinal range of records
1,700–2,000 m

Number of priority species
9

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Parnassius mnemosyne								•
Zegris eupheme						•		
Apharitis cilissa				•				
Lycaena euphratica		•					•	
Pseudophilotes bavius								•
Polyommatus dezinus	•						•	
Polyommatus ciloicus						•		
Brenthis mofidii								
Euphydryas aurinia								•



PBA no. **Name**

DA20 Buzul Mountain

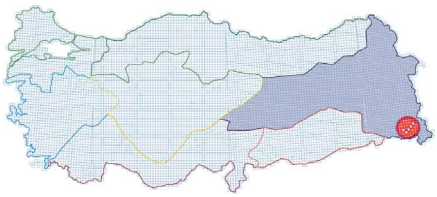
Province (District)
Hakkari (Hakkari, Yüksekova)

Square code & central coordinates
MG05 43°55′28.56 E, 37°32′07.80 N

Altitudinal range of records
1,400–2,300 m

Number of priority species
9

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Zegris eupheme						•		
Pseudophilotes bavius								•
Polyommatus buzulmavi	•						•	
Polyommatus fatima		•						
Polyommatus baytopi		•						
Polyommatus anticarmon	•						•	
Polyommatus ninae		•						
Polyommatus turcicus		•						
Brenthis mofidii								



PBA no. **Name**

DA21 Zap Suyu Valley/Basin

Province (District)
Hakkari (Hakkari, Yüsekova) : Van (Başkale)

Square codes & central coordinates
LG75 43°35′06.72 E, 37°31′55.20 N
LG84 43°41′59.64 E, 37°26′35.16 N
LG95 43°48′41.40 E, 37°32′03.86 N
MG06 43°55′23.88 E, 37°37′32.52 N
MG17 44°02′07.80 E, 37°43′00.48 N

Altitudinal range of records
1,100–3,120 m

Number of priority species
24

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Parnassius mnemosyne								•
Papilio alexanor								•
Zegris eupheme						•		
Callophrys mystaphia		•		•				
Apharitis cilissa	•							
Pseudophilotes bavius								•
Polyommatus dezinus	•						•	
Polyommatus buzulmavi	•						•	
Polyommatus fatima		•						
Polyommatus cornelia	•							
Polyommatus ciloicus					•			
Polyommatus karacetinae							•	
Polyommatus antidolus	•						•	
Polyommatus hopfferi	•							
Polyommatus anticarmon	•						•	
Polyommatus ninae		•						
Polyommatus pierceae	•						•	
Polyommatus turcicus		•						
Brenthis mofidii								
Euphydryas aurinia								•
Hyponephele urartua	•				•			
Hyponephele naricoides	•							
Muschampia plurimacula						•		
Spialia osthelderi				•				

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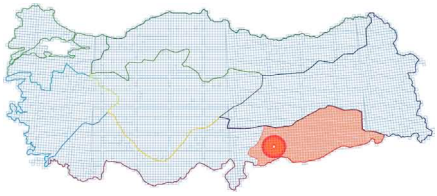
Lebanese silver-line
(*Apharitis acamas*)

Southeast Anatolia



PBA no. **Name**
GD01 Halfeti

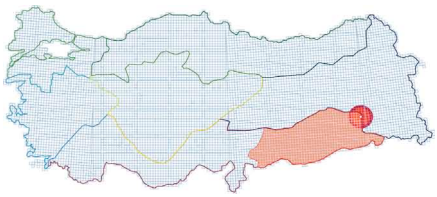
Province (District)
Şanlıurfa (Halfeti) : Gaziantep (Nizip)

Square code & central coordinates
DB02 37°55'41.88 E, 37°15'54.72 N

Altitudinal range of records
400–1,200 m

Number of priority species
3

Priority species	Endemicity		Turkish red list status					Natura 2000
	Endemic	Near End	CR	EN	VU	NT	DD	
Archon apollinus								
Apharitis cilissa				•				
Spialia osthelderi				•				



PBA no. **Name**
GD02 Baykan

Province (District)
Siirt (Baykan)

Square code & central coordinates
GC42 41°47'42.72 E, 38°08'17.16 N

Altitudinal range of records
600–1,100 m

Number of priority species
0: this square selected because it is the only known location in Turkey for Pakistani skipper (*Eogenes lesliei*).

©Oktay Subaşı

Ebert's mirza
(*Eupatura mirza*)

Appendix 2: PBA Index

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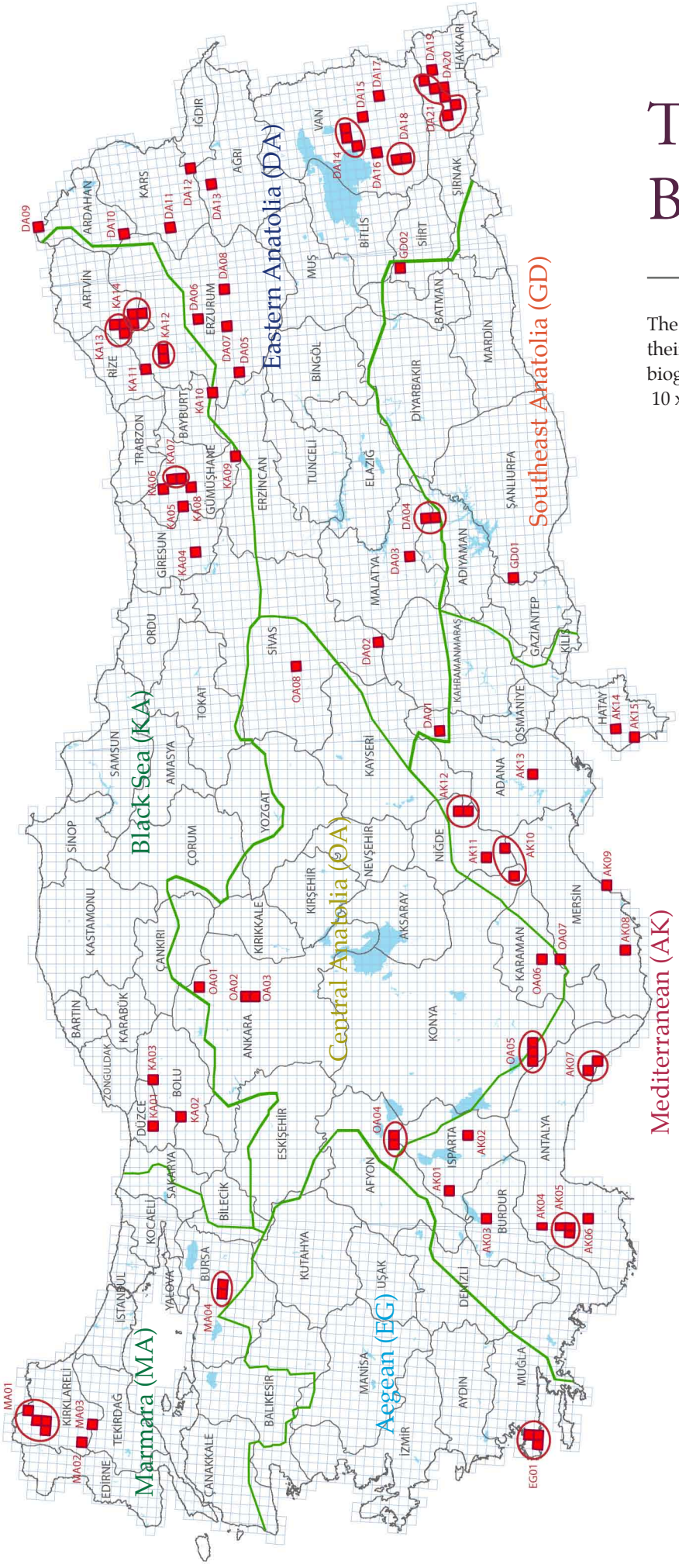
	26	KA04	Şebinkarahisar
Gümüşhane	26	KA05	Artabel Lakes
	27	KA07	Gümüşhane
	27	KA09	Sipikör Pass
	27	KA08	Tersundağı Pass
	26	KA06	Zigana Pass

Province	Page	PBA no.	PBA name
Hakkari	48	DA20	Buzul Mountain
	47	DA19	Yüksekova
	48	DA21	Zap Suyu Valley/Basin
Hatay	39	AK15	Samandağ
	39	AK14	South Amanos Mountains
Iğdır	44	DA12	Duranlar
Isparta	35	AK02	Aksu
	34	AK01	Güneykent
	32	OA04	Sultan Mountains
Kahramanmaraş	40	DA02	Gökpınar
Karaman	33	OA07	Sertavul Pass
	33	OA06	South Karaman
Kars	44	DA12	Duranlar
	44	DA11	Sarıkamış
Kayseri	38	AK12	Aladağlar
Kırklareli	23	MA02	Babaeski
	23	MA03	Düğüncübaşı
	23	MA01	İstranca Mtns / North Kırklareli
Konya	37	AK10	Bolkar Mountains
	32	OA05	Geyik Mountains
Malatya	41	DA04	Nemrut Mountain
	41	DA03	Yeşilyurt
Mersin	37	AK10	Bolkar Mountains
	37	AK08	Gülnar
	37	AK09	Limonlu Basin
	33	OA07	Sertavul Pass
Muğla	24	EG01	Bodrum-Gokova
Niğde	38	AK12	Aladağlar
	37	AK10	Bolkar Mountains
	38	AK11	Çaykavak Pass
Rize	28	KA11	Ovit Mountain
Siirt	49	GD02	Baykan
Sivas	40	DA02	Gökpınar
	34	OA08	Kurtlukaya
Şanlıurfa	49	GD01	Halfeti
Van	46	DA16	Artos Mountain
	47	DA18	Çatak Valley
	45	DA14	Erek Mountain
	46	DA17	Güzeldere Pass
	45	DA15	Güzelsu
	48	DA21	Zap Suyu Valley/Basin

Turkey's Prime Butterfly Areas



The map shows PBAs labelled with their numbers, together with provinces, biogeographical regions and the 10 x 10 km UTM grid.

Conservation Strategy for Butterflies in Turkey

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NATURE CONSERVATION CENTRE

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