

Scarce Fritillary on Mount Stogovo  
- new PBA in Macedonia

**Macedonian**  
**ENTOMOLOGICAL SOCIETY**



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## Production

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*The Scarce Fritillary (*Euphydryas maturna*) is one of the rarest butterflies in Macedonia and deserves our attention and conservation efforts.*



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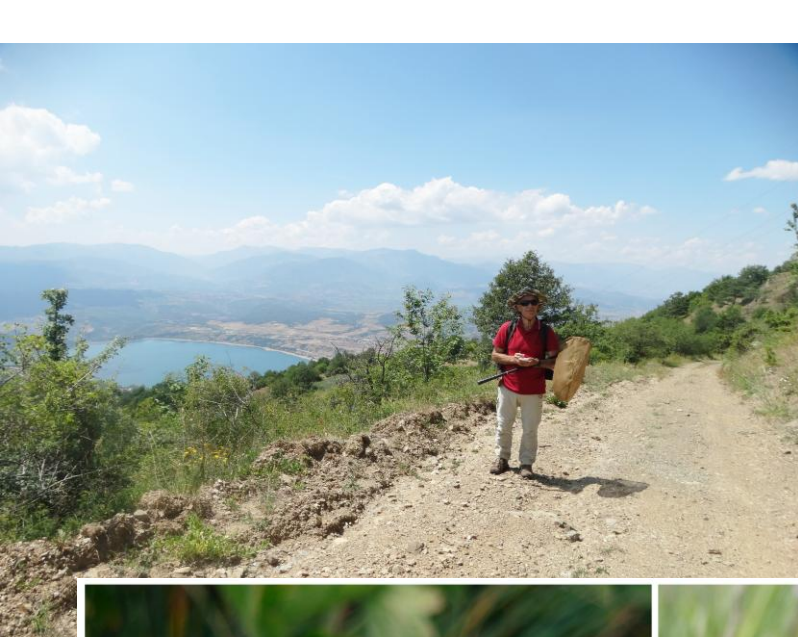


*The Large Blue (*Phengaris arion*) is another species of conservation concern (IUCN – EN) present on Stogovo Mt.*



## Summary

Scarce Fritillary (*Euphydryas maturna*) is one of the rarest and most threatened butterfly species in Macedonia, known previously only from few sites in the Northwestern part of the country located in the valley of Radika River (NP Mavrovo). During our surveys two additional sites were discovered in the Garska River valley on Mount Stogovo. Moreover, we discovered high butterfly diversity on this so far understudied mountain with total of 120 species recorded, among which 24 (20 %) are Species of Conservation Concern (SoCC). Beside the Scarce Fritillary – IUCN status VU (Vulnerable) and listed on Annexes II and IV of the Habitats' Directive, worth mentioning is the Large Blue (*Phengaris arion*) which has IUCN status EN (Endangered) and is listed on Annex IV of the Habitats' Directive.



The second author Branko Micevski during field study at the Stogovo Mt. (<above). Some of the SoCC discovered during the surveys: Scarce Fritillary (>above). Apollo (<), Marsh Fritillary (>)



## 1. Introduction

### Scarce Fritillary (*Euphydryas maturna*) in Macedonia

The Scarce Fritillary (*Euphydryas maturna*) was recorded for the first time in Macedonia in 1972 in the vicinity of Trnica village by the French entomologist Claude Dufay (Duffay, 1973). Later on, the same author separated the Macedonian population as a new subspecies *E. maturna macedonica* (Duffay, 1977). Asselbergs (1975) provides new record of the Scarce Fritillary from the region of Rostushe village (Deshat Mt.)\*. In 2013 ENTOMAK members have observed the species in the vicinity of the village Gari (Stogovo Mt.) and close to the village Volkovija (Bistra Mt). The species is very localised and rare in Macedonia, distributed only in the north-western part of the country (Radika River valley and Garska River valley).



All known sites of the Scarce Fritillary are located in protected areas (NP Mavrovo) except those in the village Gari surrounding. Mount Stogovo represents the southernmost distribution border of the species in Europe.

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\* Asselbergs (1975) - p 22: *Euphydryas maturna* L. Rostusa, Sar Planina [sic]

## Mount Stogovo - potential new PBA in Macedonia

Mount Stogovo is part of the large western Macedonian mountain chain that includes the largest and the highest mountains in Macedonia. The total area of the mountain is 243.17 km<sup>2</sup> with an average altitude of 1353 m. It is certainly one of the most interesting mountains in the country yet very poorly studied. This was mainly because of its “hidden” hard approachable character especially in the aspect of infrastructure. Therefore, researchers were mainly focused in investigations of the mountains in the Stogovo surrounding such as Karaorman Mt. or Bistra Mt. Due to the ENTOMAK’s observation of the Scarce Fritillary in 2013 in the vicinity of the village Gari it was suspected that the mountain has huge potentials to provide a new PBA in Macedonia, thus additional surveying was organized in 2015.

## 2. Activities and Objectives

**Effective conservation needs good knowledge, which can only be achieved by research. To locate the most important sites of the Mount Stogovo we conducted an extensive survey on different parts of the mountain and especially in the area where the Scarce Fritillary as well as other important SoCC were expected to be found.**

Intensive surveying was conducted in July (14-17; 26-29) and August (07-10; 21-24) on different sites of the Mount Stogovo. Due to the large area of the mountain and the limited time for field work, most interesting sites for visiting were preselected by map analyzing and those habitats in which we had success during the initial surveys (Prime Butterfly Species recorded) were revisited again in order to find more populations in the surrounding or to identify more suitable habitats for the Scarce Fritillary. Surveys were carried on different parts of the mountain and also on the highest and selected interesting peaks - in order to have a better view of the butterfly fauna in the study area - from the lowest (650 m) to the highest (2268 m) altitudes.

The main objective of the project was to gather more data on the butterfly fauna of Stogovo Mt. and especially on the distribution of the Scarce Fritillary and other Species of Conservation Concern (SoCC) in the area, in order to identify and describe the most important sites for the butterflies and verify the potentials for nomination of a Prime Butterfly Area (PBA). Another target was to raise public awareness of the area importance for the butterfly fauna. To achieve this, leaflets were distributed to local community giving information on the SoCC as well as species richness in the area and the reasons for its conservation priority. Most of the work was done in the field where we had a valuable help of the following volunteers: Vilijam Kitevski (ENTOMAK), Nikola Angjelovski (ENTOMAK) and Asim Asan (vil. Novak).



### 3. Results

**Many suitable habitats for the Scarce Fritillary were discovered in the valley of r. Garska and Jamska river, yet the species was recorded on one new locality only due to the late start of the project and missed peak of the flight season. However, the surveys resulted in discovering another three Prime Butterfly Species and significant number of SoCC.**

In total 120 species were encountered on the Mount Stogovo (Tab. 1) what represents 58 % of the butterfly fauna of Macedonia (208 sp.). The presence of 24 Species of Conservation Concern - SoCC (Tab.2) or 50 % of all Macedonian SoCC together with the rich butterfly diversity confirm the importance of the Mountain for conservation of Butterflies. The most important area – where even four Prime Butterfly species (PBS) are present is designated as a new Prime Butterfly Area (PBA) in Macedonia “PBA Stogovo – MKD 13” and is a valuable addition to the twelve PBA’s identified so far (van Swaay & Warren 2003, Micevski & Micevski 2007). Worth noting is the uniqueness of the newly designated PBA - Stogovo in the way that it represents the only PBA in Macedonia in which even four out of the five PBS can be found - what implies on the importance of its protection.

Prime Butterfly Species discovered on Mount Stogovo:

*Euphydryas aurinia*

*Euphydryas maturna*

*Phengaris arion*

*Parnassius apollo*



*Mixed deciduous forest and open woodland habitats with Ash trees are numerous in the lower valley of Jamska river*



Table 1. Butterfly fauna of Mount Stogovo

Species	Locality																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
<i>Aglais io</i>	+																				
<i>Aglais urticae</i>																	+				
<i>Anthocharis cardamines</i>	+																				
<i>Apatura ilia</i>	+																				
<i>Apatura iris</i>	+	+		+															+		
<i>Aporia crataegi</i>	+	+		+							+		+							+	
<i>Arethusana arethusa</i>		+			+					+	+					+		+			
<i>Argynnis adippe</i>	+	+			+								+					+	+	+	
<i>Argynnis aglaja</i>			+						+						+		+				
<i>Argynnis niobe</i>			+		+		+				+				+			+			
<i>Argynnis paphia</i>	+	+	+			+				+	+	+						+	+		
<i>Aricia agestis</i>		+			+	+													+	+	
<i>Aricia anteros</i>	+	+											+		+	+	+		+		+
<i>Aricia artaxerxes</i>	+	+				+		+				+	+		+				+		
<i>Boloria dia</i>					+	+	+														
<i>Boloria euphrosynae</i>											+									+	
<i>Boloria graeca</i>									+												
<i>Brenthis daphne</i>	+	+	+	+							+	+	+					+		+	+
<i>Brintesia circe</i>	+	+	+	+	+	+	+			+			+						+		
<i>Callophrys rubi</i>																				+	
<i>Carcharodus alceae</i>			+																		
<i>Carcharodus flocciferus</i>														+	+						
<i>Celastrina argiolus</i>		+	+		+						+		+						+	+	+
<i>Coenonympha arcania</i>	+	+	+	+	+	+	+	+	+		+		+	+						+	+
<i>Coenonympha pamphilus</i>					+													+	+	+	+

<i>Coenonympha rhodopensis</i>									+				+	+	+	+	+				
<i>Colias alfacariensis</i>	+		+		+	+	+	+										+	+		
<i>Colias crocea</i>		+	+		+	+	+	+	+		+		+		+	+	+	+	+	+	+
<i>Cupido decoloratus</i>						+															
<i>Cupido minimus</i>	+	+	+			+		+						+							
<i>Cupido osiris</i>	+		+			+															
<i>Cyaniris semiargus</i>	+	+									+		+	+						+	+
<i>Erebia cassioides/ottomana</i>																	+				
<i>Erebia euryale</i>									+												
<i>Erebia ligea</i>									+			+	+	+							
<i>Erebia medusa</i>	+																				
<i>Erebia melas</i>																	+				
<i>Erebia oeme</i>														+							
<i>Erebia ottomana/cassiodies</i>									+								+				
<i>Erynnis tages</i>					+	+							+							+	
<i>Euphydryas aurinia</i>	+										+		+								
<i>Euphydryas maturna</i>	+										+										
<i>Glaucopsyche alexis</i>													+								
<i>Gonepteryx rhamni</i>	+	+	+								+	+	+	+				+	+		
<i>Hesperia comma</i>										+					+	+			+		
<i>Hipparchia fagi</i>		+	+								+								+		
<i>Hipparchia statilinus</i>	+															+					
<i>Hyponephele lycaon</i>		+		+				+			+				+						
<i>Iolana iolas</i>					+																
<i>Iphiclides podalirius</i>	+	+			+	+														+	+
<i>Issoria lathonia</i>							+						+								+
<i>Kirinia roxelana</i>				+																	
<i>Lasiommata maera</i>					+						+		+	+					+	+	



<i>Lassiommata megera</i>					+			+			+										
<i>Lassiommata petropolitana</i>											+		+								
<i>Leptidea duponcheli</i>	+	+	+	+				+				+									
<i>Leptidea sinapis</i>	+	+	+	+	+	+	+	+					+		+	+		+	+	+	+
<i>Leptotes pirithous</i>					+																
<i>Libythea celtis</i>	+																				+
<i>Limenitis populi</i>																					+
<i>Limenitis reducta</i>	+	+	+							+									+		
<i>Lycaena alciphron</i>	+		+					+		+											+
<i>Lycaena candens</i>									+					+	+						
<i>Lycaena phlaeas</i>						+					+										+
<i>Lycaena tityrus</i>	+	+				+															
<i>Lycaena virgaureae</i>		+	+	+							+		+	+	+						
<i>Maniola jurtina</i>	+	+	+	+	+	+	+	+	+	+	+					+		+	+	+	+
<i>Melanargia galathea</i>	+	+	+	+	+	+	+	+	+	+	+				+	+		+	+		
<i>Melanargia larissa</i>								+	+							+	+				
<i>Melanargia russiae</i>						+		+					+	+							
<i>Melitaea arduinna</i>																					+
<i>Melitaea athalia</i>	+	+	+	+						+		+	+	+						+	+
<i>Melitaea didyma</i>		+	+				+	+		+	+		+							+	
<i>Melitaea ornata</i>			+					+													
<i>Melitaea phoebe</i>	+			+				+					+							+	
<i>Melitaea trivia</i>	+	+		+		+			+		+		+	+						+	+
<i>Nymphalis antiopa</i>																					+
<i>Nymphalis polychloros</i>	+																				
<i>Ochlodes sylvanus</i>	+	+	+	+	+						+	+	+		+				+	+	
<i>Papilio machaon</i>		+						+													
<i>Pararge aegeria</i>																			+		

<i>Parnassius apollo</i>		+	+					+	+			+		+						
<i>Parnassius mnemosynae</i>														+					+	
<i>Phengaris alcon</i>		+	+	+				+		+	+		+			+			+	
<i>Phengaris arion</i>		+																		
<i>Pieris balcana</i>		+	+	+									+		+	+		+		+
<i>Pieris brassicae</i>										+								+		
<i>Pieris mannii</i>	+	+	+	+						+	+		+						+	
<i>Pieris napi</i>			+	+														+	+	+
<i>Pieris rapae</i>	+	+			+													+	+	+
<i>Plebejus argus</i>	+	+	+								+		+	+					+	+
<i>Plebejus argyrognomon</i>														+				+		
<i>Plebejus idas</i>									+										+	+
<i>Polygonia c-album</i>	+		+		+	+					+		+						+	+
<i>Polyommatus admetus</i>						+														
<i>Polyommatus amandus</i>	+		+						+		+		+							
<i>Polyommatus bellargus</i>	+		+																+	+
<i>Polyommatus coridon</i>			+		+	+	+									+			+	
<i>Polyommatus damon</i>		+	+						+	+			+		+	+	+		+	
<i>Polyommatus daphnis</i>	+	+	+	+	+	+	+	+		+									+	
<i>Polyommatus dorylas</i>	+	+				+	+			+	+			+					+	
<i>Polyommatus eros eroides</i>	+								+											
<i>Polyommatus icarus</i>	+	+	+		+	+		+	+	+			+	+		+		+	+	+
<i>Polyommatus ripartii complex</i>					+	+	+	+								+				
<i>Polyommatus thersites</i>																+				
<i>Pontia edusa</i>	+				+													+		
<i>Pseudophilotes vicrama</i>				+	+	+	+	+	+											
<i>Pyrgus armoricanus</i>																		+		
<i>Pyrgus malvae</i>	+																			+



<i>Pyronia tithonus</i>					+																
<i>Satyrrium acaciae</i>	+	+					+	+												+	
<i>Satyrrium ilicis</i>																				+	
<i>Satyrrium spini</i>			+																		
<i>Satyrus ferula</i>		+	+							+	+										
<i>Spialia orbifer</i>					+										+						
<i>Thymelicus acteon</i>					+		+	+													
<i>Thymelicus lineola</i>	+	+	+	+					+		+				+	+					
<i>Thymelicus sylvestris</i>		+	+	+		+	+		+												
<i>Vanessa atalanta</i>	+	+	+							+	+								+	+	
<i>Vanessa cardui</i>		+			+				+						+	+		+	+		+
Nr. of spec. per locality	50	48	43	24	33	29	19	26	23	19	34	9	35	23	18	17	11	21	34	36	25

Locality description (numerals as in Tab.1 / yellow marked fields indicate Locality within the borders of the PBA – Stogovo)

N	Locality	Habitat	Altitude	Coordinates
1	Garska river bellow vil. Gari (up to the inflow of r. Jamska)	Riparian habitats – flower reach meadows, Mixed deciduous trees, <i>Salicetum incanae</i>	1000 – 1100 m	41°30'18.02"N, 20°41'22.47"E
2	Slope above vil. Gari	Rocky slope, scrub and grasslands	1150 – 1200m	41°29'53.90"N, 20°40'57.29"E
3	Garska river above vil. Gari	Flower reach meadow close to the river	1155 m	41°29'55.31"N, 20°41'2.74"E
4	Skala (NW of vil.Gari)	Rocky slopes - mixed deciduous forest with frequent clearings	1150 – 1250 m	41°30'27.43"N, 20°40'58.06"E
5	Vil. Dolno Melnicani surrounding	Rural area, field margins, slopes with oaks, shrubs	650 – 1050 m	41°30'54.90"N, 20°34'26.15"E
6	Vil. Brostica surrounding	Rural area, field margins, rocky slopes with shrubs, grasses, flowers, wet parts	1140 – 1400 m	41°29'38.77"N, 20°34'58.11"E
7	Above vil. Brostica	Dry mowed meadows	1415 – 1540 m	41°30'6.04"N, 20°35'0.69"E
8	Road to Stogovo peak	Dry rocky slopes with junipers	1550 – 1850 m	41°29'59.63"N, 20°35'40.74"E
9	Bellow Stogovo peak	Alpine areas covered in grasses and flowers	1880 – 2195 m	41°29'57.93"N, 20°36'49.23"E

10	r. Garska valley (E) - I	Clearings in mix deciduous forests dominated by <i>Ostrya</i>	1155 – 1185 m	41°30'2.23"N, 20°41'16.95"E
11	r. Garska valley (W) – I	Light penetrated mixed deciduous forest with frequent wide clearings	1230 - 1390 m	41°29'33.15"N, 20°40'33.00"E
12	r. Garska valley (W) – II	Dense beech forest with infrequent small clearings	1390 - 1500 m	41°29'0.39"N, 20°40'29.58"E
13	Bellow Ajdarova livada	Huge clearings in sparse beech forest	1500 - 1630 m	41°28'50.00"N, 20°40'17.00"E
14	Ajdarova livada > Causica peak	Meadows and grasslands	1630 – 1960 m	41°28'28.11"N, 20°39'48.10"E
15	r. Garska valley (E) - II	Dry meadows, patches of flowers near a stream.	1525 – 1595 m	41°28'32.42"N, 20°40'36.87"E
16	Vil. Novak > Bara	Overgrazed - dry grasslands/shrubby areas	1250 – 1905 m	41°26'38.13"N, 20°37'54.70"E
17	Crvena Voda > Golem Rid peak	Overgrazed meadow, pastures , scree, rocky slopes	1890 – 2268 m	41°27'4.90"N, 20°38'31.31"E
18	r. Jamska – close to the river	Flower rich meadows near Jamska river	1000 – 1010 m	41°30'28.45"N, 20°41'36.26"E
19	Jamska river valley	Light penetrated mixed deciduous forests	1010 – 1350 m	41°30'21.59"N, 20°42'0.41"E
20	Vil. Mogorche surrounding	Rural area, field margins, Oak forest clearings	670 – 1050 m	41°32'30.95"N, 20°37'4.06"E
21	Vil. Osoj surrounding	Rural area, overgrazed meadows, field margins, flower reach meadow, mixed deciduous trees	970 – 1050 m	41°31'45.25"N, 20°38'34.74"E



**Table 2. Valorization of the Butterfly fauna of Mount Stogovo**

Species of Conservation Concern (SoCC)	IUCN 2010 Red List Category (Europe)	HD 2	HD 4	B 1	B 2	SPEC 3	GTS	CORINE
<i>Apatura ilia</i>	LC							C
<i>Apatura iris</i>	LC							C
<i>Aricia anteros</i>	NT							
<i>Carcharodus flocciferus</i>	NT							
<i>Cupido decoloratus</i> *	NT							
<i>Erebia medusa</i>	LC					3		
<i>Erebia melas</i> *	LC					4a	NT	
<i>Euphydryas aurinia</i>	LC	HD2		B1	B2	3, PS		C
<i>Euphydryas maturna</i>	VU	HD2	HD4	B1	B2	3, PS		C
<i>Glaucopsyche alexis</i>	LC					3		
<i>Hipparchia fagi</i>	NT					4a		
<i>Hipparchia statilinus</i>	NT					4b		
<i>Iolana iolas</i> *	NT							
<i>Limenitis populi</i> *	LC							C
<i>Melitaea trivia</i>	LC							C
<i>Parnassius apollo</i>	NT		HD4		B2	3, PS		
<i>Parnassius mnemosynae</i>	NT		HD4		B2			C
<i>Phengaris alcon</i>	LC					3		
<i>Phengaris arion</i>	EN		HD4		B2	3,PS		C
<i>Polyommatus damon</i>	NT							
<i>Polyommatus dorylas</i>	NT					4b		
<i>Polyommatus eros eroides</i>	NT	HD2	HD4	B1		3		
<i>Pseudophilotes vicrama</i>	NT					3		
<i>Thymelicus acteon</i> *	NT							

(\*) – SoCC present on Mount Stogovo but not within the borders of the PBA Stogovo  
The Prime Species (PS) present in the PBA Stogovo are marked with red

#### Description of the evaluation criteria and meaning of the annotations used on Tab. 2.

**IUCN** - International Union for Conservation of Nature: European Red List of Butterflies (2010):  
The species classified both as threatened (CR, EN, VU) and Near Threatened (NT) (19% of the European butterflies) are all high conservation priorities.

**CR** – Critically Endangered

**EN** – Endangered

**VU** – Vulnerable

**NT** – Near Threatened

## LC – Least Concern

**HD - Habitats Directive** - Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora:

**HD2:** EU Habitats Directive Annex II: animal and plant species of community interest whose conservation requires the designation of special areas of conservation.

**HD4:** EU Habitats Directive Annex IV: animal and plant species of community interest in need of strict protection.

**B1/B2 – Bern Convention** - Species from the list of Bern convention: The States signatory to undertake the appropriate measures for the protection of habitat for wild flora and fauna:

**B1:** Bern Convention Revised Annex I of Resolution 6 (1998) of the Bern Convention listing the species requiring specific habitat conservation measures (year of revision 2011)

**B2:** Bern Convention Annex II: strictly protected fauna species

**SPEC** - Species of European Conservation Concern (SPEC's), categories of the conservation status as used in „Red data book of European butterflies“ (Van Swaay & Warren 1999):

SPEC 1 - Globally threatened species that are restricted to Europe;

SPEC 2 - Concentrated in Europe (endemics) and threatened in Europe (unfavourable conservation status);

SPEC 3 - Not concentrated in Europe but threatened in Europe (unfavourable conservation status);

SPEC 4a - Concentrated in Europe (endemics) but not threatened in Europe (favourable conservation status);

SPEC 4b - Not concentrated in Europe and not threatened in Europe (favourable conservation status)

**PS** – Prime Species are selected target species that are used for identification of PBA's in Europe. In Macedonia there are 5 Prime butterfly species (PBS) of the 34 PBS present in Europe.

**GTS** – Global Threat Status - according to the Red data book of European butterflies (1999)

**CORINE** - Threatened species of the CORINE lists: The implication is that viable populations of all species of fauna and flora (and their supporting habitats) must be retained across as wide a geographical area as possible; that is, within the full range of the natural ecosystems in which they are found at present.

*The Jersey Tiger Moth (*Euplagia quadripunctaria*) is another species of conservation importance (HD2) present in the PBA Stogovo*





## 4. Review and Conclusions

The Mount Stogovo is characterized by very rich butterfly fauna represented by 120 species confirmed so far what represents high 58 % of the butterfly fauna of Macedonia (208 sp.)

Fifteen SoCC (according to IUCN 2010 Red list evaluation criteria) present on the mountain - out of the twenty-two that can be found in Macedonia represents almost 70 % of all red listed species in the country.

High percentage of SoCC according to other evaluation criteria can be also noticed (Tab. 3). Half of the strictly protected species (Annex II of the Habitats Directive) in Macedonia are present on the mountain as well as in the PBA – Stogovo. The percentage of SoCC listed on Annex IV of the Habitats Directive, Annexes I and II of the Bern Convention and with SPEC 3 status (threatened in Europe) is also exceeding 50 %.

The knowledge on the distribution of the Scarce Fritillary on Mount Stogovo in this moment is based on two localities only. Due to the delayed start of the project and missed peak activity of the species (June), we recorded only two specimens during our surveys. Both records were made in the Valley of Garska River (1 km distanced from each other). However, many suitable habitats can be found also in the Valley of Jamska River where numerous *Fraxinus* trees and woodland clearings were observed, thus the species presence in that area is expected.

Beside the Scarce Fritillary, another three Prime Butterfly Species were discovered on the mountain and enough data was gathered in order to nominate the most important area as a new PBA in Macedonia/Europe.

Description of the “PBA – Stogovo MKD 13” is given in addition.

**Table 3. Overview of the SoCC number/percentage present on the Stogovo Mt. / Macedonia**

Species of Conservation Concern (SoCC)	IUCN 2010 Red List Category (Europe)	HD 2	HD 4	B 1	B 2	SPEC 3	GTS	CORINE
Nr. of SoCC per category Stogovo Mt.	15	3	5	3	5	9	1	8
Nr. of SoCC per category Macedonia	22	5	10	5	9	14	3	20
% of SoCC per category (Stogovo/Macedonia)	68 %	60 %	50 %	60 %	56 %	64 %	33 %	40 %
Total number of SoCC on Stogovo Mt. is 24 sp. and represent 50 % of all Macedonian SoCC (48 sp.)								

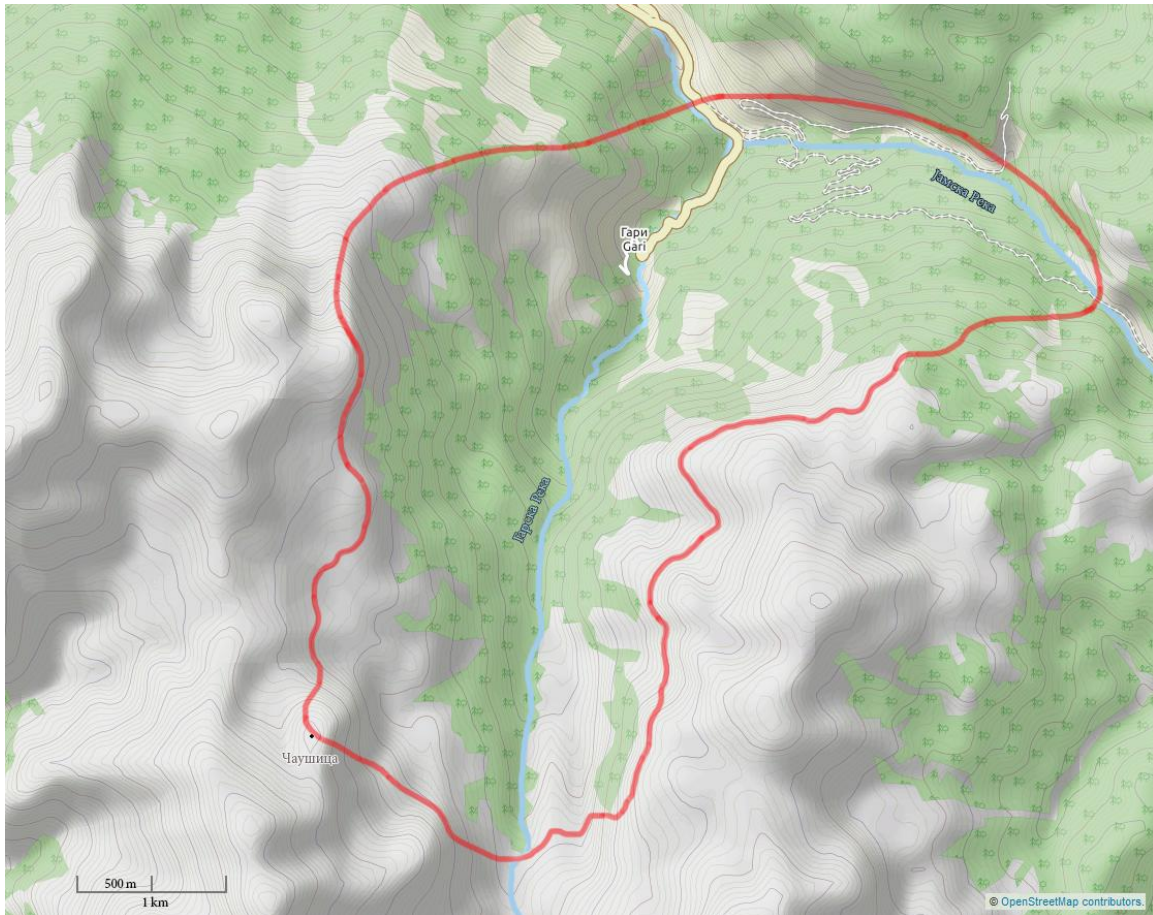
# PBA Stogovo

## Macedonia MKD-13

Coordinates: 41°30'N- 20°41'E

Altitude: 985-1960 m

Area: 1460 ha



### General description

Stogovo is a mountain in the western part of Macedonia, belonging to the large western Macedonian mountain chain that includes the largest and the highest mountains in the country. The PBA stretches from the bifurcation below the vil. Gari (985 m) upstream of the river Garska toward the peak of Causica (1960 m). The stratigraphic foundation is composed of Paleozoic crystalline schists and marbles through which lie Mesozoic sedimentary- carbonate-series. Typical plant communities are *Quercus-Ostrya carpinifoliae*, *Festuca heterophyllae*-Fagetum and *Calamintha grandiflorae*-Fagetum. *Salicetum incanae* occurs in the riparian zone.



## Butterflies

Species	Approximate number of breeding areas	Data available	Trend	Key habitats *
<i>Euphydryas aurinia</i>	2-10	Moderate	unknown	37, 38, 41
<i>Euphydryas maturna</i>	2-10	Poor	unknown	37, 41
<i>Phengaris arion</i>	2-10	Poor	unknown	38
<i>Parnassius apollo</i>	2-10	Satisfactory	unknown	36, 37, 38, 41

## Protection and threats

**Protection status:** unknown

**Land use:** forestry, nature conservation, pasture

**General threats (in order of importance):** land drainage, afforestation, felling of woodland, overgrazing, natural events

## Conservation issues

Land drainage could be a severe threat due to the planned activities for catching the waters from Garska river for the Hydropower project “Boskov Most”

## Remarks

This is the only PBA that hosts four out of the five Prime Butterfly Species in Macedonia. Significant number of breeding areas (11-100) of the Alcon blue (*Phengaris alcon*) are also present. Other important butterfly species are: *Apatura ilia*, *Apatura iris*, *Aricia anteros*, *Carcharodus flocciferus*, *Coenonympha rhodopenis*, *Erebia medusa*, *Erebia oeme*, *Glaucopsyche alexis*, *Hipparchia fagi*, *Melitaea trivia*, *Parnassius mnemosynae*, *Polyommatus damon*, *Polyommatus dorylas*, *Polyommatus eros eroides* and *Pseudophilotes vicrama*.

More research is needed to provide better description of the habitat and population ecology of the PBS. Another species of conservation importance are the Jersey tiger moth *Euplagia quadripunctaria* listed on Annex II of the Habitats Directive and the Long-horned beetle *Morimus funereus* with IUCN World status – Vulnerable (VU), listed on Annex II of the Habitats Directive and on the CORINE list of threatened species.

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\* as in van Swaay & Warren (2003) Prime Butterfly Areas in Europe

## 5. Future Actions

ENTOMAK will continue to monitor the known Scarce Fritillary populations and widen its search for potential new populations in the western part of Macedonia.

Keep searching for support for designation of new, comprehensive - updated PBA's in Macedonia as a precondition for a proper conservation of the Macedonian butterflies as part of the European natural heritage.

Protection of the “PBA Stogovo – MKD 13” and all other PBA’s under national law and later on their inclusion as NATURA 2000 sites is essential and ENTOMAK will encourage the government officials to take that step.

Intensify the communication with the local government and population to achieve best possible in situ protection of the Scarce Fritillary.

Raise further funding to study the butterfly fauna in Macedonia as one of the butterfly richest countries in Europe yet insufficiently studied.



*Catching the waters of the rivers for Hydropower projects can severely impact the habitats of the Scarce Fritillary.*

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