



EVALUATION OF BIRD FAUNA AT MATKA CANYON, MACEDONIA

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SYNOPSIS

The survey of bird fauna of Matka Canyon (river Treska, northern Macedonia) was done in the period from 1996 to 2008. In total, 112 bird species were recorded, one of which (the Egyptian Vulture *Neophron percnopterus*) is globally threatened. Sixteen species are included in the Annex I of the Bird Directive and listed on the Resolution 6 of the Council of Europe on the Bern Convention (Emerald species). Eleven species are considered with unfavourable conservation status, and concentrated in Europe (SPEC Cat. 2), and 28 more have unfavourable conservation status, but are not concentrated in Europe (SPEC Cat. 3). Eighty-three species are included in the Appendix II of the Bern Convention, and 42 species are on the Appendix II of the Bonn Convention. Three species are included in the African-Eurasian waterfowl Agreement, and 15 species are included in Appendices I and II of the CITES convention.

Canyon Matka is proposed Emerald site in Macedonia, and potentially fulfils the criteria for its designation as Important Bird Area in Europe, although it has not been designated.

The article gives full list of species, with their breeding status, population size estimation and evaluation criteria.

INTRODUCTION

Due to its close proximity to Skopje, Matka Canyon has been visited or studied by more ornithologists or zoologists. The earliest data originate from Stresemann (1920), who explicitly mentions presence of five species (Common Kestrel *Falco tinnunculus*, Eurasian Green woodpecker *Picus viridis*, Yellow Wagtail *Motacilla flava feldegg*, Ring Ouzel *Turdus torquatus* and rock Bunting *Emberiza cia*), and Doflein (1921), mentioning seven species (Common Cuckoo *Cuculus canorus*, Common

Chiffchaff *Phylloscopus collybita*, Willow Warbler *Phylloscopus trochilus*, Ring Ouzel, Eurasian Blackbird *Turdus merula*, Marsh Tit *Parus palustris* and European Greenfinch *Carduelis chloris*). During his work on the fauna of Skopje valley, Karaman (1929, 1930, 1949) probably gathered numerous data on birds of Matka, yet precisely noted only 23 species. Among them, he encountered the Bearded Vulture *Gypaetus barbatus*, Cinereous Vulture (*Aegypius monachus*), Penduline Tit (*Remiz pendulinus*) and Collared Flycatcher (*Ficedulla albicollis*). About the same time, Matvejev (1948), working on the collection of the Macedonian Museum of Natural History, gives data for four species (Red-rumped Swallow *Hirundo daurica*, Ring Ouzel - the same specimen from Doflein and Stresemann, Subalpine Warbler *Sylvia cantillans* and Western Rock-nuthatch *Sitta neumayer*). Dimovski (1960, 1968) working in the gorges of Skopje valley, for the rocky habitats mentions 21 species, yet without noting which of them were found at Matka. Grubač (1997) gives data on the breeding of the Griffon and Egyptian Vultures. Grubač (2001) reports presence of the Wallcreeper (*Tichodroma muraria*). Presently, exemplars of 17 species obtained from Matka are found in the collection of the Macedonian Museum of Natural History, among which the White-tailed Eagle (*Haliaeetus albicilla*), Golden Eagle (*Aquila chrysaetos*, Black Woodpecker (*Dryocopus martius*) and Yellow-billed Cough (*Pyrrhocorax graculus*) (Ivanovski, 2000). Velevski (2001) has noted the presence of the Blue Rock-thrush (*Monticola solitarius*). Most recent data are provided by Skorpiková et al. (2007), who have observed two species of birds of prey (Eurasian Sparrowhawk *Accipiter nisus* and Peregrine Falcon *Falco peregrinus*). Altogether, this makes a list of 46 species for which published data exist.

The Canyon is an exclusive refugium for numerous relict flora and fauna species that had sheltered here during the Pleistocene glaciations. High overall biodiversity value of the Canyon was reason that parts of it were designated as protected area "Matka" in the category "monument of nature" since 1994, while since 1960 the other parts are included in the "Jasen" reserve, presently designated as "multi-purpose protected area".

Matka Canyon was proposed as Emerald site in Macedonia (Ministry of Environment and Physical Planning of Republic of Macedonia, 2007).

STUDY AREA

Matka Canyon occupies the lower course of river Treska, before its confluence into river Vardar, in the northern parts of Macedonia (Fig. 1a). Rarely, it is also called Shishevska Gorge, or more commonly, Treska Gorge. It is a narrow gorge cut among mountains Suva Gora to the northwest and Suva Planina and Vodno to the southeast and east. The total length of the gorge is about 15 km. The altitude ranges from 310 m (the exit point of the river from the gorge) to 1401 m (Krstec Tepe, Suva Gora Mt.).

The climate is similar to that of the wider region of Skopje Valley, i.e. modified continental, with strong Mediterranean influence. Average annual precipitation is

around 515 mm, and average annual temperature around 12° C. Western winds are predominant (Lazarevski, 1993).

Geologically, it is build by crystal shists and crystal limestone (marbles) (Luković, 1930).

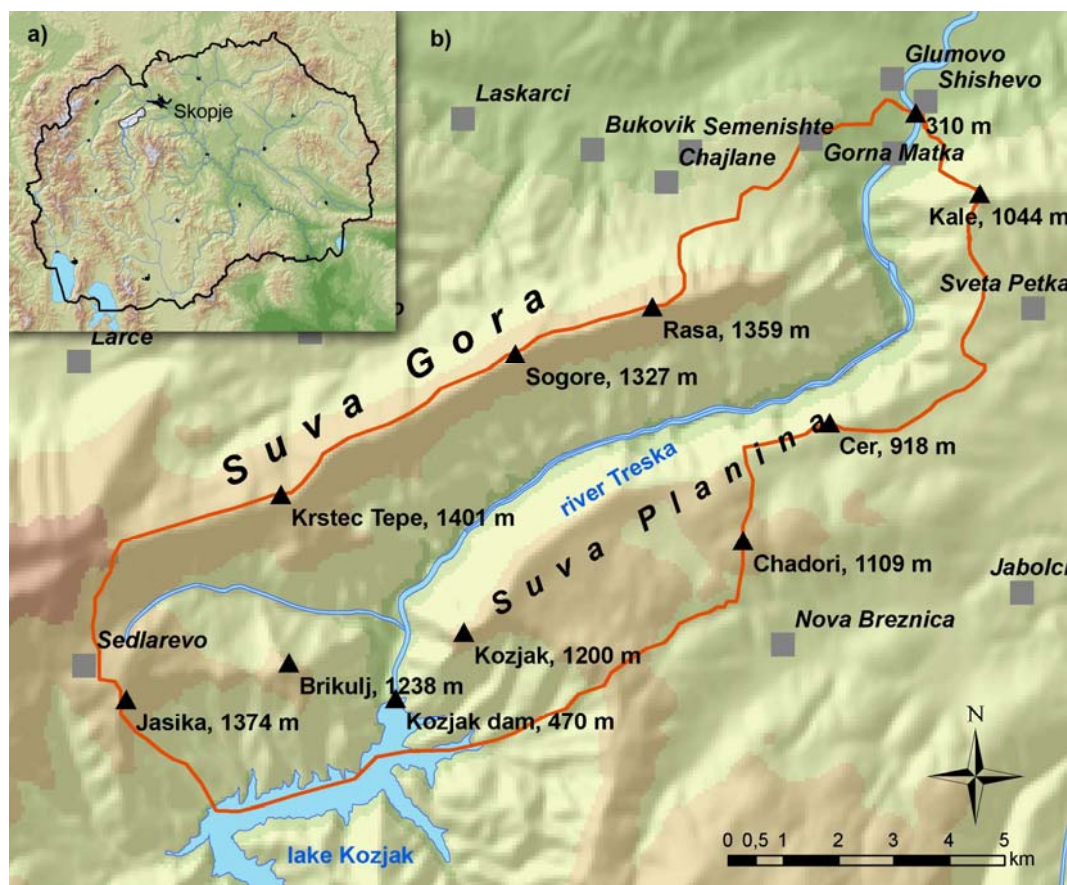


Figure 1. Matka Canyon: a) location of the study area and b) boundaries of the study area

The climatic conditions, complex geology and the altitudinal range lead to presence of diversity of habitats, associations and species. Dominant habitats are calcareous cliffs, thermophilous and supra-Mediterranean oak woods, mixed thermophilous forests, Western Palaeartic cypress, juniper and yew forests, dense perennial grasslands and middle European steppes, Moesian lilac thickets and beech forests. Most prominent plant associations are the following: ass. *Syringo-Buxetum* Tomašević 1959, ass. *Humili-Ostrietum carpinifoliae* Lj. Mic. 1980, ass. *Quercetum trojanae macedonicum* Em et Ht (1950)1959, ass. *Quercetum frainetto-cerris macedonicum* Oberd. 48 em. Ht. 59, ass. *Orno-Quercetum cerris macedonicum* Em 1964, ass. *Seslerio-Ostryetum* Ht. et H-ić 1950, ass. *Juniperetum excelsae-foetidissimae* Em 1962, ass. *Micromerio-Violetum kosaninii* Ht. 1936, ass. *Scolopendrio-Tilietum* Riz. and ass. *Quercu-carpinetum macedonicum* Em 1968 (Ministry of Environment and Physical Planning of Republic of Macedonia, 2007).

The first narrow reservoir "Matka" on Treska River was created in 1938, with the construction of dam "Matka", with total length of 6 km. Dam "Kozjak" was constructed on the entry point of the river into the gorge in 2004, creating the reservoir "Kozjak", and currently third dam ("Sveta Petka") is under construction in the Canyon. Reservoirs provide conditions for presence of some waterfowls, although in small number.

Study area occupies this entire section, together with the plateau Rudina on Suva Planina (90 km², Fig. 1b).

MATERIALS AND METHODS

Birds were surveyed in the period from 1996 to 2008. Birds were observed freely in nature, using binoculars and telescope, mostly in the morning hours. Several night visits were done in order to register nocturnal species. For the raptors and other important species total census was done, leading to very precise estimations of their populations. Since 2003 regular monitoring of the vultures was done, also noting details of their biology.

Most intensively studied parts are around and along reservoir "Matka", and also along the ridge of Suva Planina Mt., where passerines have been surveyed in detail. In the other parts, thorough observations were done using telescope, in order to locate birds of prey.

Gathered data were analyzed, and for each species its breeding status was assessed. Estimations of population size were done for all species, although in some cases the estimation is very approximate. Evaluation was done using following criteria: SPEC Category, European Threat Status (BirdLife International, 2004), IUCN Red List (IUCN, 2007), Council Directive 79/409/EEC on the conservation of wild birds - Birds Directive (Council of Europe, 1979), Resolution No. 6 of the Standing Committee of the Convention on the Conservation of European Wildlife and Natural Habitats (1998) listing the species requiring specific habitat conservation measures, appendices of international conventions (Convention on the Conservation of Migratory Species of Wild Animals - Bonn Convention, Convention on the Conservation of European Wildlife and Natural Habitats - Bern Convention, Convention on International Trade in Endangered Species of Wild Fauna and Flora - CITES) and the Agreement on the Conservation of African-Eurasian Migratory Waterbirds - AEWA.

English and Latin names of the species, as well as their systematic order, follow BirdLife International (2004).

RESULTS AND DISCUSSION

In total, 112 species were registered at Matka Canyon (Tab. 1). Out of them, 51 are resident species, 34-37 are migratory species that are breeding in the Canyon, 15 are wintering and 5-8 species were found only on migration (Tab. 2).

Table 1. List of species registered in the Canyon Matka, with their breeding status, population estimation and evaluation criteria.

No	Species	Breeding status	Population estimation	BiE2 SPEC category	BiE2 European Threat Status	2007 Global IUCN Red List Category	Birds Directive	Emerald Network	Bern Convention	Bonn Convention	CITES	AEWA
1	<i>Tachybaptus ruficollis</i>	W	1-5 i	—	S				II			
2	<i>Phalacrocorax carbo</i>	W, M	1-10 i	—	S				III			
3	<i>Ardea cinerea</i>	W	1-2 i	—	S				III			
4	<i>Ciconia nigra</i>	B?	0-1 p	2	R		I	Yes	II	II	II	Yes
5	<i>Anas platyrhynchos</i>	W	(5-15 i)	—	(S)		II/1; III/1		III	II		Yes
6	<i>Neophron percnopterus</i>	B	1 p	1	EN	EN	I	Yes	II	II	II	
7	<i>Gyps fulvus</i>	R (ex)	0-1 p	—	S		I	Yes	II	II	II	
8	<i>Circaetus gallicus</i>	B	2-3 p	3	(R)		I	Yes	II	II	II	
9	<i>Circus aeruginosus</i>	M	> 4 i	—	S		I	Yes	II	II	II	
10	<i>Accipiter gentilis</i>	R	1-2 p	—	S				II	II	II	
11	<i>Accipiter nisus</i>	R	1-2 p	—	S				II	II	II	
12	<i>Buteo buteo</i>	R	3-5 p	—	S				II	II	II	
13	<i>Aquila chrysaetos</i>	R	1 p	3	R		I	Yes	II	II	II	
14	<i>Falco tinnunculus</i>	R	3-5 p	3	D				II	II	II	
15	<i>Falco subbuteo</i>	M	1 i	—	(S)				II	II	II	
16	<i>Falco peregrinus</i>	R	1 p	—	S		I	Yes	II	II	I	
17	<i>Alectoris graeca</i>	R	10-15 p	2	(D)		II/1		III			
18	<i>Tringa ochropus</i>	M	> 1 i	—	S				II	II		Yes
19	<i>Columba livia</i>	R	(>10 p)	—	(S)		II/1		III			
20	<i>Columba palumbus</i>	R	(>20 p)	— ^E	S		II/1; III/1					
21	<i>Streptopelia decaocto</i>	R	(10-20 p)	—	S		II/2		III			
22	<i>Streptopelia turtur</i>	B	(>50 p)	3	D		II/2		III	II		
23	<i>Cuculus canorus</i>	B	(>30 p)	—	S				III			
24	<i>Otus scops</i>	B	(>5 p)	2	(H)				II		II	
25	<i>Bubo bubo</i>	R	3-5 p	3	(H)		I	Yes	II		II	
26	<i>Athene noctua</i>	B	(>5 p)	3	(D)				II		II	
27	<i>Caprimulgus europaeus</i>	B	(>10 p)	2	(H)		I	Yes	II			
28	<i>Apus apus</i>	B	(>10 p)	—	(S)				III			
29	<i>Alcedo atthis</i>	W	(1-2 i)	3	H		I	Yes	II			
30	<i>Merops apiaster</i>	B	(5-10 p)	3	(H)				II	II		
31	<i>Upupa epops</i>	B	(>20 p)	3	(D)				II			
32	<i>Jynx torquilla</i>	B?	(<5 p)	3	(D)				II			
33	<i>Picus canus</i>	R	(>2 p)	3	(H)		I	Yes	II			
34	<i>Picus viridis</i>	R	(>10 p)	2	(H)				II			
35	<i>Dryocopus martius</i>	W	2-4 i	—	S		I	Yes	II			
36	<i>Dendrocopos major</i>	R	(>10 p)	—	S				II			
37	<i>Dendrocopos syriacus</i>	R	(>10 p)	— ^E	(S)		I	Yes	II			
38	<i>Dendrocopos medius</i>	R	(>10 p)	— ^E	(S)		I	Yes	II			

No	Species	Breeding status	Population estimation	BiE2 SPEC category	BiE2 European Threat Status	2007 Global IUCN Red List Category	Birds Directive	Emerald Network	Bern Convention	Bonn Convention	CITES	AEWA
39	<i>Dendrocopos minor</i>	R	(>10 p)	—	(S)				II			
40	<i>Galerida cristata</i>	R	(>20 p)	3	(H)				III			
41	<i>Lullula arborea</i>	R	(20-50 p)	2	H		I	Yes	III			
42	<i>Alauda arvensis</i>	B	(<10 p)	3	(H)		II/2		III			
43	<i>Hirundo rupestris</i>	B	(>30 p)	—	S				II			
44	<i>Hirundo rustica</i>	B	(10-30 p)	3	H				II			
45	<i>Hirundo daurica</i>	B	(>20 p)	—	(S)				II			
46	<i>Delichon urbica</i>	B	(>20 p)	3	(D)				II			
47	<i>Anthus trivialis</i>	B	(>10 p)	—	S				II			
48	<i>Motacilla cinerea</i>	R	(5-10 p)	—	S				II			
49	<i>Motacilla alba</i>	R	(5-10 p)	—	S				II			
50	<i>Cinclus cinclus</i>	R	(2-5 p)	—	S				II			
51	<i>Troglodytes troglodytes</i>	R	(>100 p)	—	S				II			
52	<i>Prunella modularis</i>	W	(<50 i)	— ^E	S				II			
53	<i>Erithacus rubecula</i>	R	(>150 p)	— ^E	S				II	II		
54	<i>Luscinia megarhynchos</i>	B	(>100 p)	— ^E	(S)				II	II		
55	<i>Phoenicurus ochruros</i>	R	(>30 p)	—	S				II	II		
56	<i>Phoenicurus phoenicurus</i>	B	(1-5 p)	2	(H)				II	II		
57	<i>Saxicola rubetra</i>	M?	(>10 i)	— ^E	(S)				II	II		
58	<i>Oenanthe oenanthe</i>	B	(10-20 p)	3	(D)				II	II		
59	<i>Oenanthe hispanica</i>	B	(20-40 p)	2	(H)				II	II		
60	<i>Monticola saxatilis</i>	B	(5-10 p)	3	(H)				II	II		
61	<i>Monticola solitarius</i>	B	(5-10 p)	3	(H)				II	II		
62	<i>Turdus merula</i>	R	(>150 p)	— ^E	S		II/2		III	II		
63	<i>Turdus pilaris</i>	W	(>50 i)	— ^{EW}	(S)		II/2		III	II		
64	<i>Turdus philomelos</i>	R	(10-20 p)	— ^E	S		II/2		III	II		
65	<i>Turdus viscivorus</i>	R	(>30 p)	— ^E	S		II/2		III	II		
66	<i>Cettia cetti</i>	B?	(1-5 p)	—	S				II	II		
67	<i>Hippolais pallida</i>	B	(>20 p)	3	(H)				II	II		
68	<i>Sylvia cantillans</i>	B	(>30 p)	— ^E	(S)				II	II		
69	<i>Sylvia hortensis</i>	B	(1-5 p)	3	H				II	II		
70	<i>Sylvia curruca</i>	B	(<10 p)	—	S				II	II		
71	<i>Sylvia communis</i>	B	(>20 p)	— ^E	S				II	II		
72	<i>Sylvia borin</i>	M	(>1 i)	— ^E	S				II	II		
73	<i>Sylvia atricapilla</i>	B	(>100 p)	— ^E	S				II	II		
74	<i>Phylloscopus collybita</i>	R	(>20 p)	—	S				II	II		
75	<i>Regulus regulus</i>	W	(>100 i)	— ^E	S				II	II		
76	<i>Regulus ignicapilla</i>	W	(>10 i)	— ^E	(S)				II	II		
77	<i>Muscicapa striata</i>	M, B?	(>50 i)	3	H				II	II		
78	<i>Ficedula hypoleuca</i>	M	(> 5 i)	— ^E	S				II	II		
79	<i>Aegithalos caudatus</i>	R	(>30 p)	—	S				III			

No	Species	Breeding status	Population estimation	BiE2 SPEC category	BiE2 European Threat Status	2007 Global IUCN Red List Category	Birds Directive	Emerald Network	Bern Convention	Bonn Convention	CITES	AEWA
80	<i>Parus palustris</i>	R	(30 p)	3	D				II			
81	<i>Parus lugubris</i>	B	(10-30 p)	— ^E	(S)				II			
82	<i>Parus ater</i>	W, M?	(>10 i)	—	(S)				II			
83	<i>Parus caeruleus</i>	R	(>50 p)	— ^E	S				II			
84	<i>Parus major</i>	R	(>100 p)	—	S				II			
85	<i>Sitta europaea</i>	R	(>30 p)	—	S				II			
86	<i>Sitta neumayer</i>	R	(10-30 p)	— ^E	(S)				II			
87	<i>Tichodroma muraria</i>	W	2-5 i	—	(S)				II			
88	<i>Certhia brachydactyla</i>	R	(>1 p)	— ^E	(S)				II			
89	<i>Oriolus oriolus</i>	B	(>30 p)	—	S				II			
90	<i>Lanius collurio</i>	B	(>20 p)	3	(H)		I	Yes	II			
91	<i>Lanius excubitor</i>	W	(<5 i)	3	(H)				II			
92	<i>Lanius senator</i>	B	(15-30 p)	2	(D)				II			
93	<i>Garrulus glandarius</i>	R	(>30 p)	—	S		II/2					
94	<i>Pica pica</i>	R	(5-10 p)	—	S		II/2					
95	<i>Pyrrhocorax graculus</i>	B?	(1-2 p)	—	(S)				II			
96	<i>Corvus corone</i>	R	(1-3 p)	—	S		II/2					
97	<i>Corvus corax</i>	R	3-5 p	—	S				III			
98	<i>Sturnus vulgaris</i>	R	(>10 p)	3	D		II/2					
99	<i>Passer domesticus</i>	R	(>10 p)	3	D							
100	<i>Passer montanus</i>	R	(>10 p)	3	(D)				III			
101	<i>Fringilla coelebs</i>	R	(>200 p)	— ^E	S				III			
102	<i>Fringilla montifringilla</i>	W	(>30 i)	—	S				III			
103	<i>Carduelis chloris</i>	R	(>50 p)	— ^E	S				II			
104	<i>Carduelis carduelis</i>	R	(>20 p)	—	S				II			
105	<i>Carduelis spinus</i>	W	(3-50 i)	— ^E	S				II			
106	<i>Carduelis cannabina</i>	R	(>30 p)	2	D				II			
107	<i>Pyrrhula pyrrhula</i>	W	(>10 i)	—	(S)				III			
108	<i>Coccothraustes coccothraustes</i>	R	(30-60 p)	—	S				II			
109	<i>Emberiza citrinella</i>	W	(>50 i)	— ^E	(S)				II			
110	<i>Emberiza cirrus</i>	R	(>30 p)	— ^E	S				II			
111	<i>Emberiza cia</i>	R	(>30 p)	3	(H)				II			
112	<i>Miliaria calandra</i>	R	(>30 p)	2	(D)				III			

Abbreviations:

Breeding status: R-resident, R(ex) - resident, disappeared during the study period, B -breeding, M - during migration, W - wintering; ? - status uncertain;

Population estimation: p - pairs; i - individuals, () - estimation provisional.

SPEC Categories: 1 - SPEC Cat. 1; 2 - SPEC Cat. 2; 3 - SPEC Cat. 3; "—^E" - non-SPEC in Europe; "—^{EW}" - non-SPEC in Europe for wintering populations; "—" - non-SPEC.

European Threat Status: EN - Endangered; D - Declining; R - Rare; H - Depleted; S - Secure, () - status provisional. **2007 IUCN Global Red List:** EN - Endangered

Considering also the historical data, total of 120 species have been reported for Matka Canyon.

The Black Stork was observed flying above the Canyon only once (29.07.2004), and it is possible that this bird comes from a pair breeding at reservoir "Kozjak", outside of the studied area.

The Yellow-billed Choughs were also observed only once in the breeding period (the same day with the Black Stork, 29.07.2007), when four individuals were seen. Formerly it was considered to breed in the Canyon (B. Grubač, pers. comm), but presently this status can not be surely confirmed. It is numerous in the Canyon during adverse weather conditions in winter, when flock of up to 50 individuals can be seen, probably coming from Jakupica Mt.

Surprisingly, I have not confirmed presence of several other species, above all Icterine Warbler *Hippolais icterina* and Wood Warbler *Phylloscopus sibilatrix* that are common during autumn migration in the closest surrounding of the studied area (I have observed them at Suva Planina), Willow Warbler and Collared Flycatcher that are common migrants in Macedonia (closest to Matka I have observed them at Vodno Mt.), and Tawny Pipit *Anthus campestris* and Ortolan Bunting *Emberiza hortulana*, which are breeding close to the study area border (wider surrounding of village Sveta Petka), and for which suitable habitats exist also within the studied area.

Evaluation of the avifauna is presented in Tab. 2. Only one globally threatened species was found (the Egyptian vulture, classified as *Endangered*, IUCN 2007, not shown in Tab. 2.). It has also been classified as *Endangered* regarding its European threat status, and in SPEC Category 1, following the principles of BirdLife International (2004). There are 11 species (9.8%) classified as having unfavourable conservation status and concentrated in Europe (SPEC Cat. 2), and 28 species (25%) having unfavourable conservation status but not concentrated in Europe (SPEC Cat. 3). Most of them (7-8 and 17-18, consecutively) belong to the group of migratory breeding species. Three species (the Black Stork *Ciconia ciconia*, the Golden Eagle *Aquila chrysaetos* and the Short-toed Snake-eagle *Circaetus gallicus*) are classified as *Rare* regarding their European threat status. Declining species and species with depleted populations are mostly residents and migratory breeders, while largest is the number of secure species.

As much as 16 species (14.3%) have been included in the Annex 1 of the Bird directive and in Resolution 6 of the Council of Europe, 11 of which are residents and migratory breeders. All but six species are included in the appendices of the Bern Convention, and 42 species are included in the Appendix II of the Bon Convention. Fifteen species are included in the Annexes of the CITES Convention (only the Peregrine Falcon is included in the Annex I), and only three species are included in the African-Eurasian Waterfowl Agreement.

Table 2. Evaluation of the bird fauna at Matka Canyon according to the breeding status.

Evaluation Criteria		breeding status										Total	Percentage	
		R	R (ex)	B	B?	M, B?	M	M?	W, M?	W, M	W			
		number of species												
SPEC category	SPEC Cat 1			1								1	0,9%	
	SPEC Cat 2	5		5	1							11	9,8%	
	SPEC Cat 3	10		14	1	1					2	28	25,0%	
	non-SPEC E	13		5			2	1				5	26	23,2%
	non-SPEC EW											1	1	0,9%
	non-SPEC	23	1	7	2		3		1	1		7	45	40,2%
European Threat Status	EN			1								1	0,9%	
	R and (R)	1		1	1							3	2,7%	
	D and (D)	8		6	1							15	13,4%	
	H and (H)	6		12		1					2	21	18,8%	
	S and (S)	36	1	12	2		5	1	1	1	13	72	64,3%	
Birds Directive	Annex I	7	1	4	1		1				2	16	14,3%	
	Annex II/1	2										2	1,8%	
	Annex II/2	8		2							1	11	9,8%	
	Annexes II/1; III/1	1									1	2	1,8%	
	not included	33		26	3	1	4	1	1	1	11	81	72,3%	
Emerald Network	Included	7	1	4	1		1				2	16	14,3%	
	not included	44		28	3	1	4	1	1	1	13	96	85,7%	
Bern Convention	Annex II	32	1	28	4	1	5	1	1		10	83	74,1%	
	Annex III	13		4						1	5	23	20,5%	
	not included	6										6	5,4%	
Bonn Convention	Annex II	12	1	16	2	1	5	1			4	42	37,5%	
	not included	39		16	2				1	1	11	70	62,5%	
CITES	Annex I	1										1	0,9%	
	Annex II	6	1	4	1		2					14	12,5%	
	not included	44		28	3	1	3	1	1	1	15	97	86,6%	
AEWA	Included				1		1				1	3	2,7%	
	not included	51	1	32	3	1	4	1	1	1	14	109	97,3%	
Total		51	1	32	4	1	5	1	1	1	15	112	100,0%	
Percentage		45,5%	0,9%	28,6%	3,6%	0,9%	4,5%	0,9%	0,9%	0,9%	13,4%	100,0%		

From historical point of view, Matka Canyon was of greater importance for birds of prey, and even Bearded Vulture is reported as breeder (Karaman, 1949). The Cinereous Vulture was also breeding in the gorge with 2-3 pairs (Karaman, 1929). The Egyptian Vulture was present with 2-3 pairs until recently, possibly up to 2004 (Karaman, 1930, B. Grubac, pers. Comm., Grubac & Velevski, unpublished), and the Griffon Vulture population strongly declined, from ca. 40 individuals in 1920's (Karaman, 1929) (but, 20 pairs, Karaman, 1930), 20 individuals after the World War Two (Karaman, 1949) 3-4 couples in 1991-1992 (Grubac, 1997) to only one in 2004, that eventually stopped to breed and abandoned the territory in 2006. Special conservation measures (proper management programmes of the protected areas

"Matka" and "Jasen", restocking, reintroduction) are needed to preserve the last pair of Egyptian Vultures and to make possible returning of the Griffon and Black Vultures.

Due to lack of published complete data on bird faunas from the other gorges in Macedonia (e.g., Babuna, Demir Kapija, Crna Reka etc., from where only information on some species are given) at this moment it is not possible to compare the composition and the characteristics of the avifauna at Matka with other sites.

The site was assessed towards the criteria for designation of Important Bird Areas in Europe (Heath & Evans, 2000), and although it potentially meets the criteria (presence of globally threatened species, or nationally important population of Eurasian Eagle-owl *Bubo bubo*), it is not proposed as such.

CONCLUSION

In the period from 1996 to 2008, 112 bird species have been registered at Matka Canyon. Most of them (88 species, 78.6% are all year residents or breeding migrants). One globally threatened species, the Egyptian Vulture (classified as *Endangered*) is present with one pair. Thirty-nine species (34.8%) have unfavourable conservation status in Europe (SPEC Categories 2 and 3), 31 species are included in the Annexes of the Birds Directive, 16 species (14.3%) are Emerald species, as much as 83 species (74.1%) are strictly protected species under the Bern Convention (Appendix II), and 42 species (37.5%) are included in the Appendix II of the Bonn Convention. Together with the historical data, list of birds recorded at Matka counts 120 species.

Canyon Matka have greatly lost its importance for birds after disappearance of several species today considered threatened, such as the Bearded and the Black Vulture, and also completely lost the breeding colony of Griffon Vultures. Special conservation activities are needed for their return at the Canyon.

Matka Canyon is proposed as Emerald site, but is not among the priority locations in Macedonia for its designation as Important Bird Area in Europe.

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