

Status and Population Trend of the Eastern Imperial Eagle (*Aquila heliaca*) in Europe in the Period 2000-2010

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Abstract: The summary of data from range countries estimates the population size of the Eastern Imperial Eagle (*Aquila heliaca* Savigny 1809) in Europe at 1800-2200 pairs, which reflects a significant increase compared to previous estimations. Also, there has been a significant increase in the number of known breeding pairs reaching 1134 known territories. Recent intensified surveys on distribution and abundance in key regions (Russia, Kazakhstan, European Turkey, Macedonia, Azerbaijan), as well as the currently recorded stabilization and increase of the entire Carpathian population makes a more precise status assessment of Eastern Imperial Eagles in Europe possible. Although in recent years the population of Eastern Imperial Eagles in some Balkan countries has been studied more intensively, further detailed research is still needed in potential breeding areas in SE Europe. In the region of Thrace (Bulgaria and European Turkey) the Eastern Imperial Eagle population was found to be more abundant, while population decline has been recorded in Greece, Macedonia, and Serbia. Russia and Kazakhstan hold the largest populations of the Eastern Imperial Eagle in Europe, which seem to be stable. Between 2000 and 2010 a sevenfold increase was documented in the number of known breeding pairs of Eastern Imperial Eagles in Europe. Based on the results of regional surveys in range countries, the Eastern Imperial Eagle population status in Europe can be considered to be stable and probably increasing.

Key words: Eastern Imperial Eagle, Population, Europe, status

Introduction

The conservation threat status of the Eastern Imperial Eagle is classified as vulnerable globally (BIRDLIFE INTERNATIONAL 2008) and rare at European level (BIRDLIFE INTERNATIONAL 2004). The species is listed in Annex 1 of the European Union's Birds Directive, Appendix 1 of CITES, and Appendix 2 of the Bonn and Bern Conventions. It is a Palearctic species (VOOUS 1960), whose breeding range extends from Austria in the west (16° E) to Lake Baikal in the east (110° E) and from the South-Ural mountains in the north (57° N) to Turkey in the south (39° N) (WICHMANN 2011, KARYAKIN *et al.* 2008, GÜRSAN, BILGIN 2002). Scattered breeding populations of the species are known in Central Europe, the Balkans, Asia Minor, Eastern Europe, Kazakhstan, Southern Siberia, and northernmost parts of China and Mongolia. Possible northward range expansion has been recorded for the past decade, and single pairs have been bred even in the 59° and 60° northern latitudes in Siberia (SOROKIN 2009, MOSHKIN 2009). The western populations of the Eastern Imperial Eagle (i.e. Central Europe, Balkan and Asia Minor) are mainly residents, while the eastern ones are long-distance migrants (DEL HOYO *et al.* 1995). The

migratory populations winters in the Middle East, the Arabian Peninsula, North-East Africa (reaching Tanzania), India, Southeast Asia and also in Korea, Japan, and Taiwan to the east (CRAMP, SIMMONS 1980, KHAN *et al.* 1996, WELLS 1999, FARNSWORTH *et al.* 2000, BIRDLIFE INTERNATIONAL 2001, UETA, RYABTSEV, 2001, SCOTT, ADHAMI, 2006, LOBLEY 2007, KIRWAN *et al.* 2008).

The population size and status of the species was not precisely known in most of its European range until the end of the 20th century. Scarce bibliographic data shows that in the 19th century the Eastern Imperial Eagle was a widely distributed species with high-density populations in the Balkans and other parts of Europe (ETTINGER 1857, RUDOLF VON OSTERREICH *et al.* 1878, LEVERKÜHN 1907, ALLEON, VIAN, 1869). During the 20th century the species' population in Central and Southeast Europe was subject to strong anthropogenic pressure marked by drastic decline. The last comprehensive summary of the species' status in Europe was published after the 4th International Imperial Eagle Conference (Budapest, 23-24 November, 1998), and it reported different population trends and completely different levels of knowledge in the range countries at the millennium (HORVÁTH *et al.* 2002). In the last decade of the 20th century, increasing, decreasing, and stable populations were recorded in various parts of the species' range in Europe. The population of the Carpathian basin started to increase in size and expanded its range into the lowlands from the mountains during the 1990's (BAGYURA *et al.* 2002). The Balkan populations were also properly surveyed and reported to be more or less stable (STOYCHEV *et al.* 2004 A), while only rough population estimations and no reliable trend data were available for Turkey and for the largest East-European populations (Ukraine, Russia and Kazakhstan). The total European population was estimated to be between 1051-1619 breeding pairs in 2000 (HORVÁTH *et al.* 2002) and 1099-1752 breeding pairs in 2003 (summarized at the 5th International Imperial Eagle Conference, Budapest, 23 May 2003, HORVÁTH, KOVÁCS PERS. COMM.).

In the present paper we are summarizing the available information on the status of the Eastern Imperial Eagle in the European countries between 2000 and 2010.

Methods

The presented population data is based on the 12 presentations held at the 6th International Conference on the Conservation of the Eastern Imperial Eagle (5-7 September 2008, Topolovgrad, Bulgaria). Population data was also updated with the most recent available publications and by personal communication with national experts, where it was possible or necessary. The financial and personnel capacities, and also the exact methods of surveys differed among countries.

Results

The current European status of the Eastern Imperial Eagle is discussed and summarized on a country-by-country basis.

Albania

The species' status remains unknown. A pair with territorial behaviour was recorded in 1996 and 1997 at the Albanian-Greek national border (SAKOULIS, BOURDAKIS, 2002). The country could possibly hold several breeding pairs, but data on any confirmed breeding of the species is not available in international literature.

Armenia

The recent status of the Eastern Imperial Eagle in Armenia is unknown. The last confirmed breeding of the species in the country was in 1979 (M. GHASABYAN, PERS. COMM.). Abuladze (1996) reported 2-3 pairs in Armenia at the Georgian and Azerbaijani border between 1984 and 1991. One adult bird was observed 2 km from the Armenian border in Georgia in September 2007 (HORVÁTH, KOVÁCS PERS. COMM.). Previously, the population was estimated at 2-10 pairs (HORVÁTH *et al.* 2002), but the most recent estimation is 0-2 pairs, as there is no proof of breeding of the species during the last three decades (HORVÁTH *et al.* 2006). Except in the north-eastern corner of the country, where the breeding of the species is probable, the Imperial Eagle is very rare in Armenia and it occurs there primarily during migration.

Austria

In 1999, after being absent for almost 200 years, the species returned as a breeder in the Austrian

avifauna (WICHMANN 2011). For the past ten years, the population has increased slowly but continuously. The population comprised 4-5 breeding pairs by 2009 (WICHMANN 2011), and in 2010 six nesting pairs have already been located (WICHMANN PERS. COMM.). The breeding pairs were found in the eastern part of the country, near the Hungarian, Czech, and Slovakian national borders.

Azerbaijan

Thirty-one active territories were recorded in North-western Azerbaijan in the period 2007-2008 (HORVÁTH *et al.* 2008), and further 18 nests were found in the Western part of the country in 2010 (SULTANOV 2010). As the largest parts of the country are potentially suitable for the species and are not specifically surveyed, the estimations for the total population of the country are widely ranged between 50 and 150 pairs (HORVÁTH *et al.* 2006, HORVÁTH *et al.* 2008).

Bosnia and Herzegovina

No recent information was found on the status of the species in this country. Breeding of Eastern Imperial Eagles has not been confirmed, but the existence of a few territories cannot be excluded near the Croatian and Serbian borders (BIRDLIFE INTERNATIONAL 2010).

Bulgaria

Since 2000, following a drastic population decline during the second half of the 20th century, the population number of the Eastern Imperial Eagle in Bulgaria has been increasing. The national population was estimated at 20-25 pairs in 2002 (STOYCHEV *et al.* 2004 B) and 25-30 pairs in 2008 (DEMERDZHIEV *et al.* 2011 A). In the period 2001-2010, 14 newly occupied territories were discovered and 3 cases of re-occupied territories were recorded. In 2009, the number of known occupied territories increased to 20. Between 2001 and 2010, in total, 25 different breeding territories were occupied, mostly in South-East Bulgaria.

Croatia

There is no available data on the status of the species in Croatia. Breeding of one or two pairs near to the Serbian border is possible (HORVÁTH *et al.* 2002).

Cyprus

Until the end of the 20th century there was a small breeding population in the Trodos Mountains

(FLINT, STEWART, 1992), which was most probably exterminated before 2000 (HORVÁTH *et al.* 2002).

Czech Republic

After the first breeding record of the Eastern Imperial Eagle in the country in 1998, annually 1-3 pairs were breeding in the south-eastern part of the country till 2009 (HORAL 2011), while a total of 5 breeding territories have been located in 2010 (HORAL PERS. COMM.). The Czech Republic represents the north-western limit of the species' breeding range, and the appearance of the species in the country was facilitated by the population increase in Hungary and Slovakia.

Georgia

GALVEZ *et al.* (2005) reported a small and decreasing Eastern Imperial Eagle population for Georgia consisting of only 10-15 pairs. On the other hand Abuladze (2010) reported 30-40 breeding pairs in the country for the period 2001-2010, and he also assumes that the population size has been continuously increasing since 1975. The breeding population of the Eastern Imperial Eagle is concentrated in the south-eastern part of the country, with no breeding recorded in the western and northern regions.

Greece

The last breeding attempt of Eastern Imperial Eagles in Greece dates back to 2000, reported for the Dadia Forest Reserve (POIRAZIDIS 2001). Although no nest was found, in the spring of 2000 the birds were recorded bringing food, and on July 27th an adult was recorded flying together with a juvenile. The population in 2000 was estimated to consist of at least 3 breeding pairs (SACOULIS 2001). Bourdakis (2003) estimated the population at 0-3 pairs. In recent years, breeding of 1-2 pairs along the lower reaches of the Evros River, or in the region of Thrace, near the Bulgarian-Turkish border, has been a possibility (L. SIDIROPOULOS PERS. COMM.).

Hungary

The population increase of the Eastern Imperial Eagles, which had been observed since the 1980's, continued between 2001 and 2009 (HORVÁTH *et al.* 2011). Compared to 2000, when the population was estimated at 55-60 pairs (HORVÁTH *et al.* 2002), the number of pairs has doubled and reached 120-130

pairs by 2010 (HORVÁTH pers. comm.). This increase was recorded in lowland agricultural habitats, while a decreasing trend was observed in the previously occupied forested mountain territories.

Kazakhstan

The latest researches in Kazakhstan revealed significantly larger populations of the Eastern Imperial Eagle, than was previously expected. They are estimating the total population of the country between 3500 and 4000 pairs, which represents the largest national population of the species within its entire range (KARYAKIN *et al.* 2008, KARYAKIN *et al.* 2011). The population of the European part of the country (Western Kazakhstan) is located in the Volga-Ural sands, with about 600 nesting pairs (KARYAKIN *et al.* 2006). There are 93 known nests in Western Kazakhstan, however only 10 % of the potential breeding range has been surveyed to date (I. KARYAKIN PERS. COMM.). This figure has doubled previous estimations from the late 1990s (BELIK *et al.* 2002). The population trend of the Eastern Imperial Eagle in Kazakhstan indicates a steady increase, which maybe directly related to the range expansion of the Yellow Sousek (*Spermophilus fulvus* LICHTENSTEIN 1823) and the increase of the eagles' abundance in semi-desert and desert areas. There, the species has been adapted to nest on electric poles and saxaul savanna, and forced the Steppe Eagles (*Aquila nipalensis* HODGSON 1833) out in some areas.

Kosovo

There is no precise information available on the status of the Eastern Imperial Eagle in country. In April 2004, a pair was recorded in the vicinities of Gnjilane (GRUBAČ, STOJNIĆ, 2011), and the breeding of several pairs cannot be excluded.

Moldova

No recent species specific surveys have been implemented in Moldova. Averin (2001) reports that the population of the Eastern Imperial Eagle is constantly decreasing in the country and only about 3 pairs may be nesting. BELIK *et al.* (2002) estimates the breeding population at 0-3 pairs.

Republic of Macedonia

During the period 2001-2008, the Eastern Imperial Eagle in Macedonia bred in 27 different active

territories, distributed along the Vardar river valley (HALLMAN 2008, LISICANEC PERS. COMM.). The breeding population between 2001 and 2008 was estimated at 15-38 breeding pairs. The population was stable and even slightly increasing between 2001 and 2003, while in the following years a heavy decrease in the number of breeding pairs was recorded, due to poisoning or direct persecution (HALLMAN 2008). By 2008, there were at least 18 active territories known in Macedonia, with a population estimated at between 18-23 breeding pairs.

Romania

The new edition of the Red Data Book of Vertebrates of Romania (MUNTEANU 2005) estimates the population at 20-40 pairs, but the breeding of the species has not been proven since 1967 in the country (LIBUS ANDRAS, UNPUBL. DATA in STOYCHEV *et al.* 2004 A). Recently systematic and large-scale raptor surveys have been implemented in Romania, which covered all previously known and the most potential Imperial Eagle habitats. The surveys revealed significant populations of other raptor species (e.g. Lesser-Spotted Eagle *Aquila pomarina* BREHM 1831), but resulted in only scarce observations in most of the cases of a single or maximum of two, mainly immature and subadult Imperial Eagles, which most probably were migrant and vagrant specimens (DARÓCZI PERS. COMM.). Based on this data the breeding status of the species in Romania is not certain, and if any breeding population exists in the country it most probably does not contain more than a few pairs.

Russia

During the last decade intensive raptor surveys have been implemented in Russia and Kazakhstan, which resulted in a significant improvement in the available information on the largest populations of the Eastern Imperial Eagle. Altogether 1122 breeding territories with 913 known nests have been located in Russia (KARYAKIN *et al.* 2011), out of which 726 active nests were in the European regions of the country, such as in the Volga-Ural region (570 pairs), along Lower and Middle Volga (120 pairs), in the Caucasus and the Don river basin (36 pairs) (I. KARYAKIN PERS. COMM.). The whole population of Russia is estimated at 3000-3500 pairs (KARYAKIN *et al.* 2011), out of which 1050 pairs are estimated in the European parts

of the country. The species is distributed in the forest-steppe on the southern edge of the Ural Mountains (500 pairs), in Bugulminsko-Belebееvskaya upland (200 pairs), in the Middle Volga (150 pairs) and in the Northern Caucasus (near 200 pairs) (KARYAKIN 2007, KARYAKIN, PAZHENKOV, 2008, BELIK, 2008). The previous estimation of the population of the Eastern Imperial Eagle in the European part of Russia was 600-900 pairs (BELIK *et al.* 2002), but the much higher recent estimate has resulted from the improved surveys and not from any significant increase of the species' populations. In general, the Russian population of the Imperial Eagle is stable in the European part (KARYAKIN *et al.* 2011).

Slovakia

Like the other part of the population of Eastern Imperial Eagle in the Carpathian basin, the number of the Slovakian pairs is increasing. Twenty-six nesting pairs were observed in 2009 in Southeast Slovakia (DANKO 2009) and 20 active breeding territories in Southwest Slovakia in 2010 (CHAVKO PERS. COMM.), which altogether represents a population of 45-50 pairs for the total territory of the country. The previous estimation of the breeding population of the species in Slovakia was 35-40 pairs in 2000 (HORVÁTH *et al.* 2002) and 40-45 pairs in 2007 (DANKO *et al.* 2011).

Ukraine

The population is estimated at 55-60 pairs distributed in the steppe area of the country, especially eastwards from the Dnepr River and 5-10 pairs also breed on the Crimea Peninsula (VETROV, MILOBOG, 2008). The population is supposed to be stable.

Turkey

The first more detailed research on the distribution and numbers of Eastern Imperial Eagle population in the European part of Turkey was carried out in the period 2008-2010 (DEMERDZHIEV *et al.* 2011 B). Twenty-five active territories occupied by Imperial Eagle pairs, distributed in three different regions were found. The breeding population was estimated at 30-50 pairs inhabiting hilly and low mountain areas of the Dervent Heights, the Strandja Mountains, and the Thracian region north of the Marmara Sea. The population is gradually increasing, being directly

connected to the pairs breeding on the other side of the border in Bulgaria and also in the Anatolian part of the country.

Serbia

After a large decline during the 20th century the small population of Serbia is more or less stable, inhabiting mainly the northern part of the country (Fruska Gora Mountains) (GRUBAČ, STOJNIĆ, 2011). In 2010 there were 2 known breeding pairs in the Fruska Gora Mountains, one additional nesting pair was found close to the Hungarian border (they did not start breeding), while adult and subadult birds were often seen in three other localities during the breeding season (STOJNIĆ PERS. COMM.). Therefore, recently 3-6 pairs are estimated to breed in Serbia.

Breeding distribution in Europe

The summary of the available data on the European populations of the Eastern Imperial Eagle is presented (Table 1). Known occupied territory was defined as a territory where at least one active nest was known in the period between 2000 and 2010.

Migration and wintering distribution

Adult territorial birds in Central and Southeastern Europe are mostly resident, spending the winter period in their breeding territories (BAGYURA *et al.* 2002, STOYCHEV *et al.* 2004 B). The dispersal movements of immature Eastern Imperial Eagles of these regions have been clarified recently by satellite tracking studies. Juvenile and immature eagles of Hungarian and Slovakian origin were dispersing throughout the Carpathian basin mostly around the lowland breeding habitats (CHAVKO *et al.* 2008). However, some individuals have migrated from the Carpathian basin to the Balkans, Asia Minor and occasionally to Israel (DANKO 1996, BAGYURA *et al.* 2002, CHAVKO *et al.* 2008). Juvenile Eastern Imperial Eagles from Bulgaria and the European part of Turkey winter to the north of the Marmara Sea, in Anatolia, Syria, Israel, Saudi Arabia, and Northeastern Africa (GRADEV *et al.* 2011 A, B, DEMERDZHIEV, UNPUBL. MANUSCRIPT, S. STOYCHEV, UNPUBL. DATA). These birds use two migratory flyways – through the Dardanelles, along the coastline of Asia Minor, or through the Bosphorus, crossing Anatolia.

Table 1. Population size and trend of Eastern Imperial Eagle breeding populations in Europe by 2010

Country	Year	Estimated population size in pairs	Known occupied territories	Population trend in the past 10 years	Reference
Austria	2010	6-7	6	Increasing	WICHMANN (PERS.COMM.)
Czech Republic	2010	5	5	Increasing	HORAL (PERS.COMM.)
Hungary	2010	120-130	119	Increasing	HORVÁTH (PERS.COMM.)
Slovakia	2007	46-50	46	Increasing	DANKO (2009), CHAVKO (PERS. COMM.)
Central Europe		177-192	176	Increasing	
Albania	2000	0-10	0	Unknown	HORVÁTH <i>et al.</i> (2002)
Bosnia and Herzegovina	2000	0-2	0	Unknown	HORVÁTH <i>et al.</i> (2002)
Bulgaria	2010	25-30	18	Increasing	DEMERDZHIEV(PERS.COMM.)
Croatia	2000	0-2	0	Unknown	HORVÁTH <i>et al.</i> (2002)
Cyprus	2000	0	0	Extinct	HORVÁTH <i>et al.</i> (2002)
Greece	2003	0-3	0	Unknown	BOURDAKIS (2003)
Kosovo	2004	0-3	0	Unknown	GRUBAČ, STOJNIC (2011)
Republic of Macedonia	2008	18-23	18	Decreasing	HALLMAN (2008)
Romania	2010	0-3	0	Unknown	DARÓCZI (PERS.COMM.)
Serbia	2010	3-6	3	Stable	STOJNIC (PERS.COMM.)
Turkey (Europe)	2010	30-50	25	Increasing	DEMERDZHIEV(PERS.COMM.)
SE Europe		76-132	64	Unknown	
Armenia	2006	0-2	0	Unknown	HORVÁTH <i>et al.</i> (2006)
Azerbaijan	2008	50-150	49	Unknown	HORVÁTH <i>et al.</i> (2008), SULTANOV (2010)
Georgia	2006	10-40	11	Unknown	HORVÁTH <i>et al.</i> (2006)
Kazakhstan (Europe)	2008	500-600	93	Increasing	KARYAKIN <i>et al.</i> (2011)
Moldova	2000	0-3	0	Unknown	HORVÁTH <i>et al.</i> (2002)
Russia (Europe)	2008	900-1050	726	Stable	KARYAKIN <i>et al.</i> (2011)
Ukraine	2008	55-60	15	Stable	VETROV, MILOBOG (2008)
East Europe		1515-1905	894	Stable	
Total population in Europe		1768-2229	1134	Stable	present data

The movements of Eastern Imperial Eagles from the East-European populations are much less understood, but they are assumed to be long-term migrants, and they are probably spending the winters in the Middle East, Arabia (EVANS 1994) and North-East Africa (ROECK 1993). Six adult Imperial Eagles were fitted with satellite tags at their wintering quarters in Saudi Arabia, and three of them were migrating back and breeding in European Russia (MEYBURG, MEYBURG, 2008).

Discussion

The summary of the data from the different countries shows that the population of the Eastern Imperial Eagle in Europe comprises 1800-2200 pairs. This number is considerably higher than previous estimates, as 1051-1619 pairs were reported in 2000 (HORVÁTH *et al.* 2002) and 1110-1624 pairs in 2008 (BIRDLIFE INTERNATIONAL 2008). The higher total estimation of the species' European population is mainly due to the significant

improvement in the quality of population monitoring in some important regions (i.e. Russia, Kazakhstan, European Turkey, Macedonia and Azerbaijan), where the eagle population sizes were likely underestimated earlier as a result of insufficient data (DEMERDZHIEV *et al.* 2011 B, HALLMAN 2008, HORVÁTH *et al.* 2008, KARYAKIN *et al.* 2011). The improvement in the quality of surveys is well reflected by the number of known breeding pairs, which increased by one order of magnitude from 154 in 2000 (HORVÁTH *et al.* 2002) to 1134 by 2010.

In parallel, a well documented increase took place in the entire Carpathian population between 2001 and 2010 (WICHMANN 2011, HORAL 2011, DANKO *et al.* 2011, HORVÁTH *et al.* 2011). Compared to 2000, the population of Eastern Imperial Eagle in Central Europe (HORVÁTH *et al.* 2002) has increased by 90 %. As a result of the conservation efforts and favourable environmental and legal changes, this population seems to be “healthy” and will probably continue to increase.

Although in recent years the population of the Eastern Imperial Eagle in some Balkan countries has been studied thoroughly (HALLMAN 2008, DEMERDZHIEV *et al.* 2011 A, B, GRUBAČ, STOJNIC, 2011), additional detailed research is still needed in many of the territories in SE Europe. In most of the countries of former Yugoslavia, Albania, and Romania, the status of the Eastern Imperial Eagle population is unknown. The population estimates in these countries are based on best expert’s opinion, using, the usually very few available field data. In the region of Thrace (Bulgaria and European Turkey) there is an increase in the number of Eastern Imperial Eagles, while a population decline is recorded in the south-western part of the Balkan Peninsula (Greece, Macedonia, and Serbia). The situation in Macedonia is particularly dynamic – population stabilization

was recorded in the period between 2000 and 2003 (29-38 pairs), followed by years of considerable decline (HALLMAN 2008).

The intensified survey and research in some regions of Eastern Europe (HORVÁTH *et al.* 2008, KARYAKIN *et al.* 2011) provided new data on the size and trends of the Eastern Imperial Eagle population in this part of the species’ range. The East European population, being the most abundant Imperial Eagle population in Europe, is probably stable. It would be particularly important that further research in the vast areas of Russia and Kazakhstan is carried out, where 30 % and 90 % of the potential breeding range of the Eastern Imperial Eagle has not ever been surveyed (I. KARYAKIN PERS. COMM.). The breeding population of the Eastern Imperial Eagle in the Caucasus also needs further study (HORVÁTH *et al.* 2006).

Compared to 2000, there is a sevenfold increase in the number of known breeding pairs of Eastern Imperial Eagles in Europe in 2010. Based on the regional studies of different countries, currently the Eastern Imperial Eagle population in Europe can be considered stable and probably increasing.

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References

- ABULADZE A. 1996. Ecology of the Imperial Eagle *Aquila heliaca* in Georgia. – In: Meyburg, B-U. and R. D. Chancellor (Eds.): *Eagle Studies*, WWGBP, Berlin, London Paris, 447-457.
- ABULADZE A. 2010. The changes in species’ composition and numbers of Birds of Prey in Georgia in 1975-2010. – In: Research and monitoring for and with raptors in Europe (EURAPMON). Inaugural Workshop. 7-9 October 2010, Scopello, Italy. (poster presentation)
- ALLEON A., J. VIAN 1869: Des migrations des oiseaux de proie sur le Bosphore de Constantinople. – *Revue et Magazine de Zoologie*, 2. Ser., 21: 305-315 p.
- AVERIN I. 2001. *Aquila heliaca* (Savigny, 1809). – In: Red Data Book of Moldova (Eds.): Dediu I, E. & Boicu, E. Babara. Stiinta, Chisinau, Moldova, 186 p.
- BAGYURA J., T. SZITTA, L. HARASZTHY, G. FIRMÁNSZKY, L. VISZLÓ, A. KOVÁCS, I. DEMETER AND M. HORVÁTH 2002. Population increase of imperial eagle (*Aquila heliaca*) in Hungary

- between 1980 and 2000. – *Aquila*, **107-108**: 133-144.
- BELIK V. 2008. Eastern Imperial Eagle (*Aquila heliaca*). – *Action plans for conservation of globally threatened bird species in Caucasus eco-region*. Moscow, Makhachkala, 141-151.
- BELIK V., V. GALUSHIN and D. BOGOMOLOV 2002. Results of the Imperial Eagle (*Aquila heliaca*) Project in Russia during 1996 and 1997. – *Aquila*, **107-108**: 177-181.
- BIRDLIFE INTERNATIONAL 2001. Threatened birds of Asia: the BirdLife International Red Data Book. Cambridge, UK: BirdLife International, 712-735.
- BIRDLIFE INTERNATIONAL 2004. Birds in Europe: population estimates, trends and conservation status. Cambridge, UK: BirdLife International. – *BirdLife Conservation Series* **12**: 374.
- BIRDLIFE INTERNATIONAL 2008. *Aquila heliaca*. In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.1. www.iucnredlist.org. Downloaded on 12 March 2010.
- BIRDLIFE INTERNATIONAL 2010. Species factsheet: *Aquila heliaca*. Downloaded from http://www.birdlife.org on 03/11/2010
- BOURDAKIS S. 2003. Localization and mapping of the breeding areas and the colonies of the species Griffon Vulture, Black Vulture, Bearded Vulture, Egyptian Vulture, Golden Eagle and Imperial Eagle in Greece. Hellenic Ornithological Society. In report of the project 'Immediate actions for the protection of six raptor species'. Hellenic Ministry for the Environment. (In Greek).
- CHAVKO J., M. CHREKOVA, B. MEYBURG, C. MEYBURG and G. DEMETER 2008. Dispersion and migration of young Eastern Imperial Eagles (*Aquila heliaca*) from Slovakia as revealed by GPS Satellite Telemetry. Proceeding of 6th International Conference on the Conservation of the Eastern Imperial Eagle, 5-7 September 2008, Topolovgrad, Bulgaria. PPT Presentation.
- CRAMP S., K. SIMMONS 1980. Birds of the Western Palearctic, Vol. **2**. Oxford University Press, Oxford, 696 p.
- DANKO Š. 1996. Beringungsergebnisse am Kaiseradler *Aquila heliaca* im Nordwesten des Brutareals. In: Meyburg, B.U. & Chancellor, R.D. (eds.) (1996). – *Eagle Studies*. World Working Group on Birds of Prey (WWGBP), Berlin, 389-403.
- DANKO Š. 2009. Monitoring, Management und Schutz der Brutplätze des Kaiseradlers in der Ostslowakei im Jahre 2009. Manuscript. Michalovce, Slovakia, 19 p.
- DANKO Š., J. CHAVKO, G. DEMETER, J. MIHOK, J. IZAKOVIČ, H. LATKOVA, S. SIRYOVÁ, M. NOGA and V. NEMČEK 2011. Conservation of Imperial eagle in the Slovak part of the Carpathian basin – Results of the EU LIFE-Nature project (2003–2007). – *Acta zoologica bulgarica, Supplementum* **3**: 71-78. (In English, Bulgarian summary).
- DEL HOYO, J., A. ELLIOTT and J. SARGATAL 1994. Handbook of the birds of the world. Vol. **2**: New World vultures to guineafowl. Lynx Edicions. Barcelona, Spain, 638 p.
- DEMERDZHIEV D. (MANUSCRIPT). The Eastern Imperial Eagle (*Aquila heliaca* Savigny, 1809) (Accipitridae – Aves) in Bulgaria – distribution, biology, ecology, numbers, and conservation measures. PhD thesis. (In Bulgarian).
- DEMERDZHIEV D., G. GRADEV, S. STOYCHEV, I. IVANOV, TS. PETROV and S. MARIN 2011a. Increase of the population of the Eastern Imperial Eagle (*Aquila heliaca*) in Bulgaria. – *Acta zoologica bulgarica, Supplementum* **3**: 41-54. (In English, Bulgarian summary).
- DEMERDZHIEV D., S. STOYCHEV, N. TERZIEV and I. ANGELOV 2011 b. Status of the Eastern Imperial Eagle (*Aquila heliaca*) in the European part of Turkey. – *Acta zoologica bulgarica, Supplementum* **3**: 87-93. (In English, Bulgarian summary).
- ETTINGER J. 1857. Srijemsko – Slavonsko – Hrvatske divje životinje, zvieri i ptice [Wild animals, beasts and birds of Srem, Slavonia and Croatia]. Tiskarnica Ignjata Karla Sopprona, Zemun.
- EVANS I. 1994. Important Bird Areas in the Middle East. – *BirdLife Conservation series*, **2**, BirdLife International, Cambridge, 410 p.
- FARNSWORTH J., R. COOMBER, P. JONES, S. MADGE, R. WEBB and M. WITHERICK 2000. Recent observation of same bird species previously considered uncommon or rare in Ethiopia. – *Bull. ABC*, **7**: 1-37.
- FLINT P., P. STEWART 1992. The birds of Cyprus. *British Ornithologists' Union. Check-list no*, **6**: 234.
- GALVEZ R., L. GAVASHELISHVILI and Z. JAVAKHISHVILI 2005. Raptors and Owls of Georgia. Georgian center for the conservation of Wildlife and Buneba Print Publishing. Tbilisi, Georgia, 128 p.
- GRADEV G., V. MATARRANZ, E. DOBREVA, D. POPOV, S. MARIN, I. IVANOV and P. ZHELEV 2011a. First results of the tracking of Eastern Imperial Eagles (*Aquila heliaca*) tagged with radio-transmitters in Bulgaria. – *Acta zoologica bulgarica, Supplementum* **3**: 15-20. (In English, Bulgarian summary).
- GRADEV G., V. MATARRANZ, E. DOBREVA, D. POPOV, I. IVANOV, I. KLISUROV, E. KMETOVA and D. VASILAKIS 2011b. First results of the tracking of an Eastern Imperial Eagles (*Aquila heliaca*) tagged with s GPS/GSM transmitter in Bulgaria. – *Acta zoologica bulgarica, Supplementum* **3**: 21-28. (In English, Bulgarian summary).
- GRUBAČ B., N. STOJNIC 2011. Present status and conservation of Imperial Eagle *Aquila heliaca* (Falconiformes, Aves) in Serbia. – *Acta zoologica bulgarica, Supplementum* **3**: 79-86. (In English, Bulgarian summary).
- GÜRSAN M., C. BILGIN 2002. The status of the Imperial Eagle (*Aquila heliaca*) in Turkey. *Aquila*, **107-108**: 187-192.
- HALLMAN B. 2008. Imperial Eagles in Macedonia. Proceeding of 6th International Conference on the Conservation of the Eastern Imperial Eagle, 5-7 September 2008, Topolovgrad, Bulgaria. PPT Presentation.
- HORAL D. 2011. Eastern Imperial Eagle (*Aquila heliaca*) in the Czech Republic. – *Acta zoologica bulgarica, Supplementum* **3**: 55-59. (In English, Bulgarian summary).
- HORVÁTH M., L. HARASZTHY, J. BAGYURA and A. KOVÁCS 2002. Eastern Imperial Eagle (*Aquila heliaca*) populations in Europe. – *Aquila*, **107-108**: 193-204.
- HORVÁTH M., A. KOVÁCS, and U. GALLO-ORSI 2006. Action Plan for Imperial Eagle (*Aquila heliaca*) in the Southern-Caucasus. BirdLife International, Wageningen, 45 p.
- HORVÁTH M., I. FATÉR, E. SULTANOV, S. ISAYEV and T. KARIMOV 2008. Status of imperial eagles in North-western Azerbaijan: population size, density, breeding success and prey composition. – Proceeding of 6th International Conference on the Conservation of the Eastern Imperial Eagle 5-7 September 2008, Topolovgrad, Bulgaria.
- HORVÁTH M., I. DEMETER, I. FATÉR, G. FIRMANŠKY, A. KLESZÓ, A. KOVÁCS, T. SZITTA, I. TÓTH, T. ZALAI and J. BAGYURA 2011. Population dynamic of the Imperial Eagle (*Aquila heliaca*) in Hungary between 2001 and 2009. – *Acta zoologica bulgarica, Supplementum* **3**: 61-70. (In English, Bulgarian summary).
- KARYAKIN I. 2007. Population structure of the Eastern Imperial Eagle range in the Volga-Ural Region and its trend during last 100 years. – *Ecological Newsletter of the Republic of*

- Chuvashia. Vol. 57. Proceedings of All-Russian conference 'Bird research in the territory of the Volga-Kama region'. Cheboksary, 163-171.*
- KARYAKIN I., A. PAZHENKOV 2008. Birds of prey of the Samara District. Samara, 66 p.
- KARYAKIN I., A. KOVALENKO and L. NOVIKOVA 2006. The Imperial Eagle in the Volga-Ural Sands: results of researches in. – *Raptors Conservation*, **6**: 39-47.
- KARYAKIN I., E. NIKLENKO, A. LEVIN and A. KOVALENKO 2008. Imperial Eagle in Russia and Kazakhstan: Population status and trends. – *Raptor Conservation*, **14**: 18-27 p.
- KARYAKIN I., E. NIKLENKO, A. LEVIN and A. KOVALENKO 2011. Imperial Eagle in Russia and Kazakhstan: Population status and trends. – *Acta zoologica bulgarica, Supplementum 3*: 95-104. (In English, Bulgarian summary).
- KHAN A., R. KHAN, A. ULLAH, M. ALI, J. MAHMOOD and K. SHEIKH 1996. Conservation perspectives of the Imperial *Aquila heliaca* and Steppe Eagle *Aquila nipalensis* in Pakistan. In: Meyburg, B-U. and R. D. Chancellor (Eds.): *Eagle Studies*, WWGBP, Berlin, London and Paris, 459-461.
- KIRWAN G., K. BOYLA, P. CASTELL, B. DEMIRCI, M. OZEN, H. WELCH and T. MARLOW 2008. The Birds of Turkey. The Distribution, Taxonomy and Breeding of Turkish Birds. – *Christopher Helm*, London. 512 p
- LEVERKUHNS P. 1907. Kaiseradler und Aasgeier am Horst. Proceeding of the International Ornithological congress, London 1905, 218-230.
- LOBLEY GR. 2007. Wintering of Greater Spotted Eagle *Aquila clanga* and Eastern Imperial Eagle *A. heliaca* in the Arabian Peninsula. – *Sandgrouse*, **29**: (2), 177-182.
- MEYBURG B., C. MEYBURG 2008. Satellite tracking of immature and adult Imperial Eagles (*Aquila heliaca*) wintering in Arabia. Proceeding of 6th International Conference on the Conservation of the Eastern Imperial Eagle, 5-7 September 2008, Topolovgrad, Bulgaria. PPT Presentacion
- MOSHKIN A.V. 2009. Records of the Imperial Eagle in the Tyumen District and Khanty-Mansiysk Autonomous Region, Russia. – *Raptor Conservation*, **15**: 127-128.
- MUNTEANU D. 2005. *Aquila heliaca*. – In: Cartae Rosie a Vertebratelor din Romania. Botnariu, N & V. Tatole (Eds.).
- POIRAZIDIS K. 2001. Imperial Eagle nests again in Dadia (in Greek). – *Otonos*, **16**: 6.
- ROECK E. 1993. The status of Europe's rarer birds of prey: Imperial Eagle. – *Birding World*, **6**: 239-242.
- RUDOLF VON ÖSTERREICH, V. HOMMEYER and A. E. BREHM 1879. Zwölf Frühlingstage an mittlerer Donau [Twelve spring days in Middle Danube area]. – *Journal für Ornithologie*, **27**: 1-83.
- SAKOULIS A. 2001. The Status of the Imperial Eagle *Aquila heliaca* in Greece. – *Acrocephalus*, **22**: (106-107), 105-108.
- SAKOULIS A., S. BOURDAKIS 2002. Status and conservation of the Imperial Eagle (*Aquila heliaca*) in Greece. – *Aquila*, **107-108**: 169-175.
- SCOTT D., A. ADHAMI 2006. An Updated Checklist of the Birds of Iran. – *Podoces*, **1**: (1/2), 1-16.
- SOROKIN A. 2009. Kondo – Alymskaya Ornithological Anomaly, Russia. – *Raptor Conservation*, **15**: 90-96 p.
- STOYCHEV S., R. ZEITZ and B. GRUBAC 2004A. Action Plan for the Conservation of the Imperial Eagle in the Balkan Peninsula. Bulgarian Society for the Protection of Birds, Haskovo, 36 p.
- STOYCHEV S., I. IVANOV, T. PETROV, S. MARIN, D. DEMERDZHIEV, G. GRADEV and D. DOMUSCHIEV 2004 B. Status of the Eastern Imperial eagle (*Aquila heliaca*) in Bulgaria in the period between 1994-2004. – In: Chancellor, R. D. & B.-U. Meyburg (Eds.): *Raptors Worldwide*. Budapest: WWGBP & MME, 653-663.
- SULTANOV E. 2010. Research study of Imperial Eagle (*Aquila heliaca*) population in Azerbaijan. Azerbaijan Ornithological Society, Baku. Project Report, 20 p.
- UETA M., V. RYABTSEV 2001. Migration routes of four juvenile Imperial Eagles *Aquila heliaca* from the Baikal region of eastern Russia. – *Bird Conserv. Int.*, **11**: 93-99.
- VETROV V., YU. MILOBOG 2008. Distribution of the Imperial Eagle in a steppe zone of Ukraine. – *Raptor Conservation*, **14**: 28-30.
- VOOS K. 1960. Atlas of European Birds. Edinburgh, Nelson. 284 p.
- WELLS D. 1999. The Birds of the Thai-Malay Peninsula. Christopher Helm. 648 p.
- WICHMANN G. 2011. The situation of the Imperial Eagle *Aquila heliaca* Savigny 1809 in Austria. – *Acta zoologica bulgarica, Supplementum 3*: 37-40. (In English, Bulgarian summary).

Състояние и тенденция на популацията на Източния Царски орел (*Aquila heliaca*) в Европа за периода 2000–2010

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(Резюме)

Въз основа на обобщените данни от различните страни, популацията на Източния Царски орел (*Aquila heliaca* SAVIGNY 1809) в Европа се оценява на 1800-2200 двойки, което показва значително увеличение в сравнение с предишни оценки. Увеличение е регистрирано и в броя на известните размножаващи се двойки, достигайки 1134 известни територии. Изследванията върху разпространението и числеността в ключови региони (Русия, Казахстан, европейска Турция, Македония, Азербайджан), както и регистрираните стабилизация и увеличение на цялата карпатска популация, дава възможност за много по-точна оценка на състоянието на Източния Царски орел в Европа. Въпреки че през последните години популацията на вида в някои балкански страни се изучава по-засилено, все още са необходими допълнителни подробни изследвания в потенциалните гнездови територии в ЮИ Европа. Установено е, че в района на Тракия (България и европейска Турция) популацията на Източния Царски орел е по-многочислена, докато в Гърция, Македония и Сърбия е регистрирано намаляване на популацията. В Русия и Казахстан се намират най-големите популации на вида в Европа, които вероятно са стабилни. В периода 2000-2010 г. е регистрирано седемкратно увеличение на броя на известните размножаващи се двойки Източни Царски орли в Европа. На базата на резултатите от регионалните проучвания в отделните страни, популацията на вида в Европа се счита за стабилна и вероятно увеличаваща се.