

THE STATUS OF THE IMPERIAL EAGLE *Aquila heliaca* IN GREECEStatus kraljevega orla *Aquila heliaca* v Grčiji

ANASTASIOS SAKOULIS

P.O. Box 237, 73110 Chania, Greece, e-mail: tasos@maich.gr

1. Introduction

The Imperial Eagle *Aquila heliaca* is listed as vulnerable on the world scale (BIRDLIFE 2000). It is a species of great conservation importance at the European level - SPEC 1 (TUCKER & HEATH 1994). In addition, it is listed in Appendix I of the Wild Birds Directive (79/409/EEC), as well as in Appendix II of the Bonn and Bern Conventions. In Greece, Imperial Eagle is listed as Threatened (HANDRINOS 1992), and until recently there were doubts as to whether the species still bred in the country (HANDRINOS 1992, HALLMANN 1996A, SAKOULIS *et al.* 1997). The species is nesting in the neighbouring countries (apart from Albania where its status is unknown): in the Former Yugoslav Republic of Macedonia (FYROM) there nest up to 10-15 pairs (GRUBAC pers. comm. 1996, MICEVSKI pers. comm. 2001), in Yugoslavia 4-5 pairs (PUZOVIĆ pers. comm. 2001), in Bulgaria approximately 20 pairs (IANKOV 1996) and in Turkey 10-15 pairs (HEREDIA 1996). The Imperial Eagle population is decreasing in all three countries, as in most parts of Europe (HALLMANN 1996A, HEREDIA 1996).

The Imperial Eagle used to be more common in Greece. During the last century, the species nested in the lowland areas of northern and continental Greece, including Attiki, Akarnania and Thessaly regions (REISER 1905). The species has also been observed in the Peloponnese, Evoia and on the Ionian islands, although nesting has not been confirmed. In the first decades of the 20th century, the Imperial Eagles were nesting on the edges of plains of central and northern Greece, favoured by traditional land use and especially livestock farming in lowland and semi-mountainous areas. This situation persisted up to the 40s during which, according to Makatsch (1950), 25 pairs were observed around the area of Thessaloniki alone, especially in the area of the triple delta of the Axios, Loudias and Aliakmonas rivers. The situation changed after World War II, following wetland drainage, agricultural intensification and gradual abandonment of livestock farming in the lower zone, resulting in the decline of the Imperial Eagle populations during the 60s (VOOUS 1960, BIJLEVELD 1974). During the 70s and 80s, the species nested mainly in Thrace and

Macedonia. Following the systematic surveys during 1980-85, the Greek population was estimated at 6-10 pairs, and nesting was recorded only in Thrace (HALLMANN 1986). In 1986, only two pairs remained (in the area of Evros) and the last confirmed nesting was recorded in Dadia Forest in 1990 (HALLMANN 1996A, 1996B). In the end of June 1996, two adult and one juvenile Imperial Eagles were sighted by Th. Kominos and me during the fieldwork. Since then more data have come out indicating the return of the species in Greece. The aim of this article is to present the current status of the Imperial Eagle in Greece, as well as its main threats.

2. Material and methods

Information on the population size and breeding distribution of the species in Greece relied on field work, and moreover on the few available bibliographical references and unpublished reports. A survey was conducted by the Hellenic Ornithological Society (HOS) during early April and 15th July 1997 (SAKOULIS *et al.* 1997), on sites where, in the past decade, adult Imperial Eagles had been sighted in the breeding season or where birds had nested. In addition, visits were made to areas with habitat suitable for the species. These areas are mainly found in the regions close to the borders with Albania, FYROM and Bulgaria. Greatest emphasis was placed on the area situated close to the Albanian borders, where in the end of June 1996 the two adults and one juvenile were observed. Later I revisited northern continental Greece, where in an attempt to confirm site occupancy I visited some of the species' traditional areas. Observations were made also during the migration seasons in central and southern continental Greece and in Crete, in order to study the species' migration in Greece. Fieldwork took place from early morning to sunset, although effective time ranged from three to eleven hours per day. Observations were made mainly from vantage points with good view over the sampling areas with the aid of 10x50 binoculars and 20-60x spotting scopes. Bird sightings were noted on 1:50,000 scale maps.

3. Results and Discussion

The survey in 1997 (SAKOULIS *et al.* 1997) and my later visits confirmed the presence of the pair of Imperial Eagles in the area situated close to the borders with Albania. During this survey, however, I did not manage to locate any other birds or pairs occupying territories in other parts of Greece. Later on, new reports came from northern Greece of two more pairs. At Dadia Forest Reserve, a new pair was formed in 1999, constituted by an adult and a subadult (POIRAZIDIS 2001). Although until now a nest has not been found, the birds have been seen carrying food in spring 2000, and on 27th July 2000 an adult was seen playing with a juvenile (POIRAZIDIS 2001). Another pair has been also observed in Western Macedonia (TSIAKIRIS *et al.* 2000). Therefore, my estimate is that Greece is inhabited by at least 3 breeding pairs of Imperial Eagle.

The Imperial Eagle is a migratory species and a great part of its European population winters in the Middle East (HEREDIA 1996). It is well documented that Greece is visited by individuals from northern countries, mostly juvenile birds, but some also winter in various large wetlands such as the Evros delta and other wetlands of Thrace, Lake Kerkini, Axios delta, Kalamas delta and the saline lagoons of Mesologgi, as well as smaller wetlands such as the Evrotas delta and Crete (SAKOULIS *et al.* 1997). The species has also been recorded during migration (but always in small numbers) in the Peloponnese and on some islands (HANDRINOS & AKRIOTIS 1997). However, in recent years more sightings of the Imperial Eagle have come from southern Greece and Crete, probably because of the increased number of birdwatchers there. Two Imperial Eagle individuals (a juvenile and an immature) were observed on Kythira island in January and February 1994, both of which remained on the island for at least 2 and 4 days respectively (KOMINOS 1995). Two juvenile birds overwintered in the Evrotas delta in January 1997 (SAKOULIS *et al.* 1997). In mid-March 1999, a pair of Imperial Eagles was observed in a valley near Mt. Parnassos (STEREA ELLADA) (pers. observ. together with G. ROUSOPOULOS). Although the site was surveyed again during the following months, the birds were not seen, most probably because they had continued their trip to the north. In spring of 1999, 11 individuals were observed in a single day passing through Antikythira (PAPAZOGLU 2000), an island between Peloponnisos (southern Greece) and Crete that serves as a bottleneck.

After the first ascertained wintering of the Imperial Eagle in Crete in 1996 (DRETAKIS 1997), some more wintering sites have been established. Probably

3-6 birds wintered in 1998-99 on the island on mountain slopes and lowland hills, especially in the south (DRETAKIS pers. comm.). Two first-winter individuals also spent the winter of 2000-01 in southwestern Crete (pers. observ. together with P. SMITH), and an adult was recorded on a mountainous site in western Crete during the winter of 1999-2000 and in November 2000 (pers. observ.). Moreover, during spring 2001, I observed (together with Paul Smith) at least 5 immature Imperial Eagles migrating in western Crete.

In Greece, 10 Imperial Eagle individuals have been recaptured up to now, i.e. birds ringed in Slovakia and Hungary were found injured or dead in Greece (POULOPOULOS 1997). This number is much greater than the total number of birds found in other countries. Danko (1996) reported that from the 315 Imperial Eagles ringed in the Carpathian basin up to June 1993, 19 were recovered (6%) up to the end of 1993. Of the 12 recovered birds from Slovakia, 4 were found in Greece (33%), while from the 4 recaptured birds from Hungary, 2 were found in Greece (50%). The rest three birds were ringed at former Yugoslavia and were not recovered at Greece. The proportion of recaptures in Greece is very high (although the available sample is too small to draw accurate conclusions), and shows the significance of Greece for Imperial Eagle migration and overwintering as well as serious dangers they face in our country. According to the available data of the Greek Animal Hospital - EKP AZ (POULOPOULOS 1997), a total of 10 recoveries have been hospitalised, of which 6 involve birds found in November - December of the year they were born, 2 birds were found in their 2nd or 3rd year, one in the spring of their 3rd year, and for one there is no available data since it was found in winter 1992 in a state of advanced disintegration.

3.1. Main threats in Greece

3.1.1. Habitat degradation

Lowland areas, which used to comprise the Imperial Eagle's habitat, were greatly influenced in Greece after World War II, since human activities gradually began to concentrate around them. Agricultural intensification and the gradual replacement of the rich traditional agricultural landscape with monocultures have led to the decline of populations of prey species (such as sousliks) and have contributed to the removal of many mature trees that were used by the species for nesting.

However, it is possible that the dramatic reduction

of lowland forests and wetland drainage have had the worst impact on the species. Interventions in forests which are used for nesting, such as logging of large mature trees, the destruction of lowland forests and disturbance by logging activities during the reproductive period have detrimental effects on the Imperial Eagle. In addition, intensive forest management causes an increase in forest road construction in previously isolated areas, which results in increased disturbance and illegal shooting (HALLMANN 1996A, DANKO 1994, HEREDIA 1996).

3.1.2. Illegal shooting

Even though the Imperial Eagle is protected by law (Law no. 414985/1985 Ministry of Agriculture) it is often illegally shot together with other protected species (DANKO 1994, HALLMANN 1996A, 1996B, 1997, POULOPOULOS 1997). A relatively extremely large number of injured Imperial Eagles are brought to EKPAZ (mostly shot), exhibiting the severity of the problem.

3.1.3. Poisoned baits

Since Imperial Eagles also feed on carcasses, they are very susceptible to poisoned baits which are used to kill carnivorous mammals (DANKO 1994, HALLMANN 1996A, 1996B). There are good reasons to believe that the last pair to nest in Dadia forest was poisoned (HALLMANN 1996A, 1996B, SKARTSI *et al.* 2000).

3.1.4. Other possible threats

Important threats in other countries also include death of Imperial Eagles caused by power lines and spring traps (HEREDIA 1996). It is uncertain, however, whether such incidents have taken place in Greece. The collection of eggs and individual birds, which is unfortunately common in other countries, is also a matter of great concern (KURTZ & LUQUET 1996). In Greece, the extent of this problem is unknown, as no organised wardening exists. Moreover, there are no data available concerning electrocution and collision with power lines.

4. Conclusions

I believe that the status of Imperial Eagle is defined, but not its population size. More research is thus necessary, especially in northern Greece where there are many remote sites with suitable habitat. The

significance of Greece for Imperial Eagle migration and overwintering is evident. It is therefore of great importance for Greece to protect and suitably manage all those areas in which the Imperial Eagle is now present (breeding and main wintering sites), or has bred in the past, and that long-term conservation is secured by designating the site as a Special Protection Area (SPA), based on Directive 79/409/EEC.

Summary

In the early 1990s, there were doubts whether the Imperial Eagle *Aquila heliaca* was still breeding in Greece, considering that the last confirmed nesting had been recorded in Dadia Forest in 1990. After the mid-1990s, new observations exhibit the presence of 3 breeding pairs in northern Greece, and at least in one case there are strong indications that breeding took place. Moreover, the observations of the species indicate that continental Greece and Crete are important for the migration of a significant part of the Imperial Eagle's population. The main threats to Imperial Eagle in Greece are habitat degradation, shooting and excessive use of poisoned baits.

Povzetek

V zgodnjih devetdesetih letih prejšnjega stoletja je obstajal precejšen dvom, da kraljevi orel *Aquila heliaca* v Grčiji še gnezdi, saj je bilo zadnje gnezdenje te ujede zabeleženo leta 1990, in sicer v gozdu Dadia. Toda v drugi polovici prejšnjega desetletja je bilo zaslediti nova opažanja o pojavljanju treh gnezdečih parov v severni Grčiji, in vsaj v enem primeru je vse kazalo na uspešno gnezdenje teh ptic. Poleg tega so opažanja potrdila, da sta celinska Grčija in Kreta pomembni za selitev precejšnjega dela populacije kraljevega orla. Sicer pa ga v Grčiji najbolj ogrožajo degradacija habitata, streljanje in pretirana uporaba strupenih vab.

5. References

- BIJLEVELD, M., (1974): Birds of Prey in Europe. London.
 Birdlife International (2000): Threatened Birds of the World. Lynx Editions & BirdLife International, Barcelona and Cambridge.
 CRAMP, S. & K.E.L. SIMMONS (1980): The Birds of the Western Palearctic: Vol II. Oxford.
 DANKO, S. (1994): Imperial Eagle *Aquila heliaca*. In: TUCKER, G.M. & F.A. HEATH (eds.): Birds in Europe: Their conservation status. Birdlife Conservation Series No. 3. BirdLife International, Cambridge.

- DANKO, S. (1996): Beringungsergebnisse am Kaiseradler *Aquila heliaca* im Nordwestern des Brutareals. In: MEYBURG, B.U. & R.D. CHANCELLOR (eds.): Eagle Studies. World Working Group on Birds of Prey, Berlin, London & Paris.
- DRETTAKIS, M. (1996): The waterbirds in 4 wetlands of Crete: population and ecological data (in Greek). MSc. Thesis. Department of Biology, University of Crete, Iraklio.
- HALLMANN, B.C.G. (1986): Raptor Surveys Greece 1980-85. Report IUCN/WWF Project 1921.
- HALLMANN, B.C.G. (1989): Status and distribution of the genus *Aquila* in Greece. *Biologia Gallo-hellenica* 15:171-176.
- HALLMANN, B.C.G. (1996A): Greece's Birds of Prey, Eleventh hour for 10 species. WWF Hellas (unpubl. report).
- HALLMANN, B.C.G. (1996B): The decline of the Imperial Eagle *Aquila heliaca* in Greece. In: MEYBURG, B.U. & R.D. CHANCELLOR (eds.): Eagle Studies. World Working Group on Birds of Prey, Berlin, London & Paris.
- HANDRINOS, G. & T. AKRIOTIS (1997): The Birds of Greece. Helm, London.
- HANDRINOS, G. (1992): Birds. In: The Red Data Book of Threatened Vertebrates of Greece. Hellenic Zoological Society & Hellenic Ornithological Society.
- HEREDIA, B. (1996): International Action Plan for the Imperial Eagle *Aquila heliaca*. In: BORJIA, H., L. ROSE & M. PAINTER (eds.): Globally Threatened Birds of Europe: Action Plans. Council of Europe Publishing.
- IANKOV, P. (1996): Preservation of the Globally Threatened Raptors in Bulgaria. In: MUNTANER, J. & J. MAYOL (eds.): Biology and Conservation of Mediterranean Raptors. SEO/Birdlife, Madrid. Proceedings of the VI Congress on Biology and Conservation of Mediterranean Raptors, Palma de Mallorca, 22-25 September 1994, Monografia 4.
- KOMINOS, T. (1995): Kythira, on the Road of Birds (in Greek). Kythirian Studies Society, Thessaloniki.
- KURTZ, C. & J.P. LUQUET (1996): The traffic in Mediterranean birds of prey. In: MUNTANER, J. & J. MAYOL (eds.): Biology and conservation of Mediterranean Raptors. SEO/Birdlife, Madrid. Proceedings of the VI Congress on Biology and Conservation of Mediterranean Raptors, Palma de Mallorca, 22-25 September 1994, Monografia 4.
- MAKATSCH, W. (1950): Die Vogelwelt Macedoniens. Leipzig.
- PAPAZOGLU, K. (2000): Two years Antikythira (in Greek). *Oionos* 13: 31.
- POIRAZIDIS, K. (2001): Imperial Eagle nests again in Dadia (in Greek). *Oionos* 16: 6.
- POULOPOULOS, I. (1997): Imperial Eagles (in Greek). *Oionos* 1: 22-23.
- REISER, O. (1905): Materialien zu einer Omis Balcanica; III Griechenland und die Griechischen Inseln. Wien.
- SAKOULIS, A., S. BOURDAKIS, B. HALLMANN & H. ALIVIZATOS (1997): The status of the Imperial Eagle *Aquila heliaca* in Greece. Report of the Hellenic Ornithological Society, Athens.
- SKARTSI, T., G. DASIOPOULOU, F. PAPAZOGLU & A. SAKOULIS (2000): Campaign against the use of poisoned baits in Greece. Announcement in the International Congress "Illegal Use of Poison in Natural Environment", 2-5 March, Alcudia, Mallorca, Spain.
- TSIAKIRIS, R., K. STARA, S. BOURDAKIS, & A. PETROPOULOU (2000): A pair of Imperial Eagles at Western Macedonia (in Greek). *Oionos*, 13: 6.
- TUCKER, G.M. & F.A. HEATH (1994): Birds in Europe: Their conservation status. BirdLife Conservation series No. 3. Birdlife International, Cambridge.
- VOOUS, K.H. (1960): Atlas of European Birds. Nelson, London.

Arrived / Prispelo: 17.7.2001

Accepted / Sprejeto: 11.11.2001