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Research article/Araştırma makalesi

Current evaluation of the Cinereous vulture (*Aegypius monachus* L.) population in Türkmenbaba mountain (Turkey)

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Abstract

Cinereous vulture is a threatened species. The second largest population of species in Western Palearctic region is found in Anatolia. Türkmenbaba mountain has one of the largest breeding colonies in Turkey. Detailed studies on Cinereous vulture colony in Türkmenbaba mountain was conducted between 2001-2005. Since then, there is no updated information on the population in the region. The aim of this study is to present current data regarding the population of the species in the area. Data on breeding pairs and fledglings number of Cinereous vulture were determined in the region. It was found that 28 pairs breed in Türkmenbaba mountain in 2016. Four nests out of the 28 which were detected as active in the beginning of breeding season were deserted (three of them in the incubation and one of them in the nestling period). Breeding success ratio of Cinereous vulture colony was 85%. Additionally, it was determined that, 10 nests which were initially found during the 2001-2005 monitoring period, used by individuals in 2016 breeding season. The breeding pair numbers that were detected in this study was the highest ever recorded for the Türkmenbaba mountain vulture breeding colony. In order to obtain more detailed information on the population of species in the region, monitoring studies for a longer period should be conducted.

Key words: Anatolia, breeding success, *Cinereous vulture*, Eskişehir, population

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Türkiye'nin en büyük Kara akbaba (*Aegypius monachus* L.) üreme alanlarından birine sahip olan Türkmenbaba populasyonuna yönelik güncel bir değerlendirme

Özet

Kara akbaba tehlike altında olan bir türdür. Türün Batı Palearktik bölgede en büyük ikinci populasyonu Anadolu'da bulunmaktadır. Türkmenbaba dağı türün en büyük üreme kolonisinden birine sahiptir. Türkmenbaba dağı Kara akbaba kolonisine yönelik olarak 2001-2005 yılları arasında detaylı çalışmalar gerçekleştirilmiştir. Ancak türün populasyonunun bölgedeki durumu ile ilgili güncel veriler bulunmamaktadır. Bu çalışmanın amacı, Türkmenbaba dağında üreyen Kara akbaba kolonisi hakkında veri toplamaktır. Bu amaçla üreyen çift sayısı ve uçma başarısına ulaşan yavru sayısını belirlemeye yönelik olarak çalışmalar gerçekleştirilmiştir. Elde edilen verilere göre bölgede 28 çiftin ürediği tespit edilmiştir. Üreme dönemi başlangıcında aktif olarak belirlenen yuvalardan 4 tanesi terk edilmiştir (3 yuva kuluçka döneminde, 1 yuva ise yavru yumurtadan çıktıktan sonraki dönemde). Koloninin 2016 yılı için üreme başarısı %85'dir. Ayrıca 2001-2005 yılları arasında tespit edilen yuvalardan 10 tanesinin 2016 üreme döneminde de kullanıldığı görülmüştür. Bu çalışmada elde edilen Kara akbaba üreyen çift sayısı Türkmenbaba dağı için tespit edilen en yüksek sayıdır. Ancak populasyonun durumu hakkında kesin verilere ulaşmak için uzun yılları kapsayan takip çalışmalarının yapılması zorunludur.

Anahtar kelimeler: Anadolu, üreme başarısı, Kara akbaba Eskişehir, populasyon

1. Introduction

Vultures are among the birds that are most severely affected by anthropogenic activities (Ogada et al., 2012). In many regions where they have spread, the reduction of their numbers as a result of the increasing pressure of the

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threatening factors has created the consequences named as the vulture crisis, and populations of numerous vulture species have gone into extinction process (Green et al., 2004; Virani et al. 2011). The main factors that threaten the vulture populations are poisoning, electrocution, collisions with wind power farms, persecution and decline in food supply (Barov and Derhé, 2011; Ogada et al., 2016; Vasilakis et al., 2017; Parvanov et al., 2018).

Increased threatened factors on the vulture species has accelerated the processes of establishing action plans for the conservation of these species by researchers, NGOs and governments extending their conservation efforts (Bowden, 2017; Botha et al., 2017). Individual numbers have increased in the population of certain vulture species which shows the importance of the studies on conservation (Moreno-Opo and Margalida, 2014; Skartsi et al., 2010b; Vlachos et al., 1999).

Studies on conserving the species can be done by monitoring the population and determining the conditions that threaten these populations (Kovács et al., 2008). From this point of view, breeding pairs and the annual number of nestlings are very important in terms of providing information about the trends of the population (Dahl et al., 2012; Di Vittorio et al., 2017). Thus, the trend and threats of the populations of endangered species can be determined and conservation efforts can be carried out.

Four vulture species are distributed in Turkey. *Aegypius monachus* (Cinereous vulture) is a species that forms loose colonies. Species, often make their nests on the tops of pine trees in Turkey, and breed once every year (Yamaç 2006; Özcan and Yamaç, 2015). Breeding period begins at the end of February. After the incubation period that lasts 50-55 days, the nestling becomes fledgling about three months later (Cramp and Simmons, 1980).

Cinereous vulture is a threatened species and qualified as "Near-threatened" according to IUCN criteria (BirdLife International, 2017). The breeding areas of species in Turkey until the present day are mostly located in the northwest part of Central Anatolia and in the southern part of the Western Black Sea Region (Yamaç, 2006; Kirazlı and Yamaç, 2013; Özcan and Yamaç, 2015). Due to the lack of detailed monitoring scheme covering the entire Turkey it is not possible to reach the clear figures regarding the entire population number, the number of breeding pairs and the distribution of the species. In this regard, the number of breeding pairs according to different sources range from 200 to 500 (Heredia, 1996; Barov and Derhé, 2011).

One of the best studied regions (Yamaç, 2006), with the second highest number of breeding pairs of Cinereous vulture in Turkey is known to be Türkmenbaba Mountain after the recently discovered colony in Middle Sakarya Region (Kirazlı and Yamaç, 2013). The Türkmenbaba Mountain Cinereous vulture population had a maximum of 26 breeding pairs known by an inventory conducted during the years 2001 and 2005 (Yamaç, 2006). However, there is no data on the status of the population in recent years. The purpose of this study is to present current data regarding the breeding parameters of the population in the area and compare them with data obtained in previous studied periods (2001-2005). For this purpose, the number of Cinereous vulture pairs breeding in Türkmenbaba mountain, the number of fledgling, the use of previously determined nests, the coordinates of new nests and the nearest neighbour distance of all used nests, were investigated. The data will provide information on the population status and the level of the threat on the Türkmenbaba Cinereous vulture population.

2. Materials and methods

The study was performed in the Türkmenbaba Mountain which is situated between Eskişehir and Kütahya in northwest Turkey (39º24’ N- 30º18’ E) (see Figure 1). Floristic, faunistic, geographic and climatic characteristics of the region were presented by Yamaç and Günyel (2010) and Güner and Yücel (2015).

Within the scope of this study, the investigations regarding the Cinereous vulture population were carried out in 2016. A total of 12 field surveys were conducted at least once a month, starting from March, the beginning of the breeding period, until the end of August. In study period, it was attempted to check all previously known nests (Yamaç, 2006) to determine occupancy, describe nesting activities and also searched for new nests within the study area. Nests were located using historical descriptions of traditional nesting site and extensive exploratory surveys on foot. Occupied (active) nests were monitored with telescope (20-45x/25-56x) and binoculars (8–20 x 40) at a safe distance to avoid disturbing the vultures. Nests were determined as occupied when, either the incubation was confirmed or the nestling was present in the nest. Otherwise the nest was deemed unoccupied. A pair that succeeded to rear a fledgling was determined as successful. Percentage of successful pairs was based on the ratio of successful nests to the total number of occupied nests. The nests that were initially confirmed to be active but in the breeding season the presence of an egg or nestling was not confirmed, were signified as unsuccessful.

After the breeding period, the coordinates of the active nests were recorded using GPS and data about the closest distances between the nests and their distributions within the region were obtained measuring the distances on Google map. In addition, evaluations were made on whether each nest was used in previous periods.

3. Results

The breeding parameters of 2016 were compared with those obtained in the previous periods (Table 1). The data from the year 2001 were not included in the comparisons, due to the fact that the surveys did not cover the whole area this particular year.

Table 1. Breeding parameters of Cinereous vulture population in Türkmenbaba Mountain according to years.

Parameters	**Year**				
	2002	2003	2004	2005	2016
Active nest number	26	26	21	23	28
Successful nest number	21	20	17	21	24
Unsuccessful nest number	5	6	4	2	4
Breeding success (%)	80	76	80	91	85

We found that the nearest neighbour distance of the active nests ranges from 137 to 2802 m, while the mean value of this parameter was found to be 693.6±551.0. The distribution of the active nests used by the population in 2016 and in the first monitoring periods (2002-2005) are shown in Figure1-5. We discover 18 new active nests in 2016. Ten nests detected to be active in the breeding period of 2016 were among the nests used between 2001-2005. Accordingly, for the 2016 breeding period, using rate of previously used nests was 35.7%. In addition, the ratio of the previously used active nests (10) in 2016 to the once active nests for at least one year between 2001 and 2005 (n = 46) was determined as 21.7%. In the 24 out of 28 nests, which were detected to be active, nestlings reached the fledgling stage. Although four nests were found to be active in the beginning of the breeding season, they were determined as empty in latter field surveys (three of them in the incubation and one of them in the nestling period). The breeding success ratio determined in the entire population was 85% (Table 1). Besides, breeding success was confirmed for 9 of the previously used 10 nests in 2016.

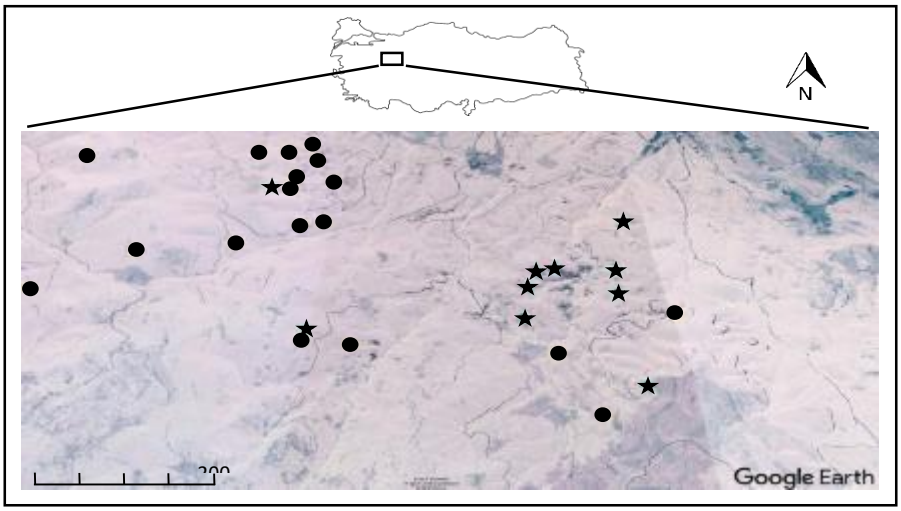

Figure 1. Active nests (28) of Cinereous vulture in 2016 in Türkmenbaba Mountain
● Nests (18) which were detected for the first time in 2016
★ Nests (10) which were detected active in the first monitoring period (2001- 2005)

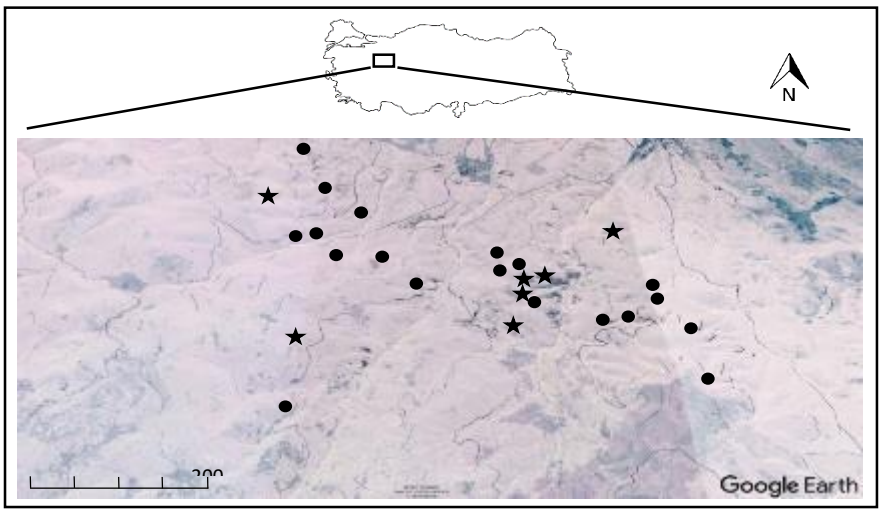

Figure 2. Active nests (26) of Cinereous vulture in 2002 in Türkmenbaba Mountain
● Nests (19) which were not used by Cinereous vulture in 2016
★ Nests (7) which were detected active in 2016

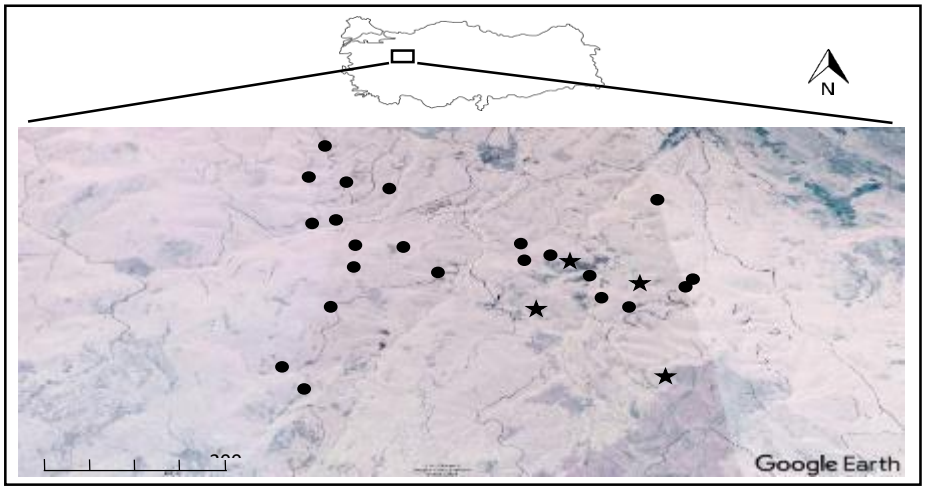

Figure 3. Active nests (26) of Cinereous vulture in 2003 in Türkmenbaba Mountain
- ● Nests (22) which were not used by Cinereous vulture in 2016
- ★ Nests (4) which were detected active in 2016

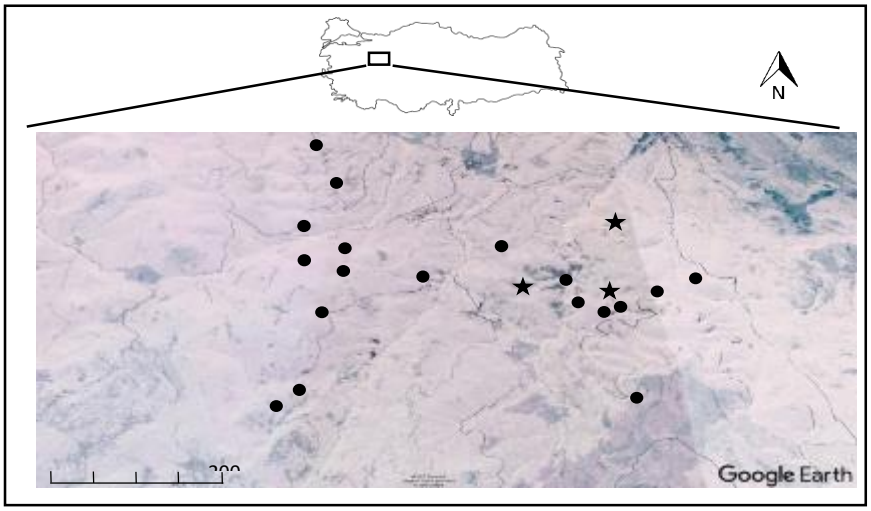

Figure 4. Active nests (21) of Cinereous vulture in 2004 in Türkmenbaba Mountain
- ● Nests (18) which were not used by Cinereous vulture in 2016
- ★ Nests (3) which were detected active in 2016

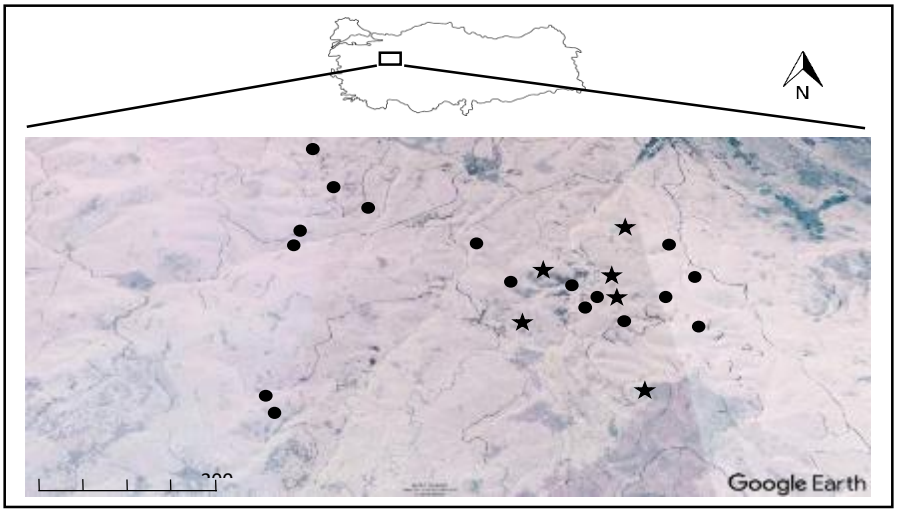

Figure 5. Active nests (23) of Cinereous vulture in 2005 in Türkmenbaba Mountain
- ● Nests (17) which were not used by Cinereous vulture in 2016
- ★ Nests (6) which were detected active in 2016

4. Conclusions and discussion

In this study, current data on the Cinereous vulture population in Türkmenbaba Mountain, which has one of the largest breeding population, has been presented. Thus, it is possible to compare resent information on the breeding parameters with the data obtained between the years 2001 - 2005, when a population monitoring in this region were carried out for first time.

A significant number (28) of active Cinereous vulture pairs have bred during the breeding period of 2016. Although this figure is close to the number of pairs reported for the first monitoring period (26), it is the highest number of breeding pairs reported for the region up to now. However, this data should not be interpreted as "positive population trends". It is known that the number of breeding pairs in the bird populations fluctuates under the influence of factors such as climate and food availability, depending on years (Väli, 2015; Clouet, 2017). In addition, in the first monitoring periods, although the whole area had been covered, the possibility that some of the areas have been overlooked due to improper terrain conditions should be considered. To make a definite assessment a long term population monitoring should be initiated.

The breeding success of the population for 2016 breeding period was 85%. When compared it with the previous monitoring period, this value is higher than the breeding success of the years 2002-2004 and lower than the breeding success of 2005. When compared to Turkey's largest Cinereous vulture breeding colony in Sündiken Mountain breeding success (78% for 2010, 73% for 2011 and 54% for 2012) (Kirazlı and Yamaç, 2013) these value have indicated to be higher for the studied colony.

Forestry activities is conducted extensively in Türkmenbaba Mountain. Roads in the forest to reach the logging areas affect negatively the wildlife, not only by fragmentation of the habitats but also by increasing uncontrolled human entrances into the region. There is an intensive human entrance to the region for recreational purposes, apart from forestry activities. The negative effects of anthropogenic activities on the Cinereous vulture populations have been emphasized in many studies (Donazar et al., 2002; Morán-López et al., 2006a; Moreno-Opo et al., 2013). However, in populations where there is no human pressure, decline in breeding success can also be reported (Reading et al., 2010). In such cases, limiting factors of natural conditions have been determined.

It is known that in breeding areas where there are no human activities, the breeding success for Cinereous vultures can be over 90% (Heredia, 1996). It has been reported that the breeding success of the Cinereous vulture colony in Dadia (Greece) is up to 95% as a result of intensive conservation activities such as strict logging control out of the breeding period (Vlachos et al., 1999). Also, it was reported that the breeding success for a colony was 100%, while the breeding success rate for the whole region was 69.2% in Extremadura (Spain) (Morán-López et al., 2006b). On the other hand, in spite of conservation efforts in breeding area, factors out of the conservation area such as poisoning and illegal hunting can affect breeding success negatively (Skartsi et al. 2008, Skartsi et al., 2010a, Skartsi et al., 2010b).

Although the breeding success of Türkmenbaba colony in 2016 compared to the studies mentioned above, is higher than the most Cinereous vulture colonies under human pressure, it can be concluded that, in case of establishing strict conservation plan for this species in our study region, the breeding success can be much higher. The spatial (out of the breeding areas) and temporal regulation (out of the breeding season) logging and recreational activates can severe to the direction of increasing the breeding success.

The nearest nest neighbour distance we found is similar to that obtained in Türkmenbaba colony the first monitoring period (min = 140, max = 1730, mean = 580 m). In another Cinereous vulture colony in the region, it was stated that the nearest active nest distance was 50 m and the mean distance varies between 346 and 398 m depending on years (Kirazlı, 2013). It was also reported that the nearest distance between the active nests in Greece was 646 m (Poirazidis et al., 2004**)**. In Spain, it was stated that the mean distance was 556.6 m for all the colonies, and the average distance varied between 490.6 and 1605.9 m for different colonies (Morán-López et al., 2006a). Moreover, the mean distance was indicated as 1104 m in Georgia (Gavashelishvili et al., 2006). It can be concluded that the nest distances of the Cinereous vultures are within a wide scale and species forms loose colonies. From this point of view, our findings are consistent with studies conducted in the region in the past and studies conducted in other regions over the world.

It was determined that 10 nests detected during the breeding period of 2016 were also used in the previous periods by the Cinereous vulture. Some of the nests detected as active in the past periods have been destroyed due to unfavourable climatic conditions, and some of them were not used in 2016. It is known that birds of prey tend to use the same nest every year (Jiménez-Franco et al., 2014). Also, Cinereous vultures prefer the same nests for nesting when there is no adverse effect of human or other ecological conditions (Cramp and Simmons, 1980). The use of the same nests in the following years shows that the nesting sites are of high quality (Sergio and Newton, 2003). The fact that only 21.7% of the nests, which were used at least once the years from 2001 to 2005, have been preferred in 2016 indicates that there may be problems with the quality of the nesting areas that are not active today, although they have been used in the past. On the other hand, according to the distribution of the nests by the years, different nests were used by individuals although they are in the same areas. Therefore, reason of abandonment should be evaluated for each nest separately and more detailed studies should be conducted to reach a conclusion on unoccupied nests.

For Cinereous vulture, the most negative effect on breeding success is human activities (Morán-López et al., 2006b; Moreno-Opo et al., 2013), which shows that the breeding area needs to be evaluated using this point of view and

serious measures must be taken. In the Türkmenbaba Mountain, which has one of the biggest breeding colonies of the Cinereous vulture in Turkey, the initiation of a strict management and conservation plan for species is considered to be of outmost importance, not only for the Turkish population but also for the world endangered population of the species.

References

Barov, B., Derhé, M. (2011). Review of the implementation of species action plans of threatened birds in the European Union (2004–2010). Final report. BirdLife International for the European Commission.

BirdLife International. (2017). *Aegypius monachus* (amended version of assessment). The IUCN Red List of Threatened Species 2017: e.T22695231A118573298. http://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T22695231A118573298.en. (Downloaded on 31 March 2018).

Botha, A.J., Andevski, J., Bowden, C.G.R., Gudka, M., Tavares, J., Safford, R. J., Williams, N. P. (2017). Multi-species action plan to conserve African-Eurasian vultures. Raptors MoU Technical Publication No. 4. CMS Technical Series No. 33. Coordinating Unit of the CMS Raptors MoU, Abu Dhabi

Bowden, C. H. R. I. S. (2017). Asian vulture crisis: Some positive signs. Birding ASIA, 27, 94-95.

Clouet, M., Gerard, J. F., Goar, J. L., Goulard, M., González, L., Rebours, I., Faure, C. (2017). Diet and breeding performance of the golden eagle *Aquila chrysaetos* at the eastern and western extremities of the Pyrénées: an example of intra-population variability. Ardeola, 64(2), 347-361.

Cramp, S., K. E. L. Simmons. (1980). Handbook of the birds of Europe, the Middle East and north Africa. The birds of the western Palearctic. Volume 2: Hawks to bustards. Oxford, London, UK & New York: Oxford University Press.

Dahl, E. L., Bevanger, K., Nygård, T., Røskaft, E., Stokke, B. G. (2012). Reduced breeding success in white-tailed eagles at Smøla windfarm, western Norway, is caused by mortality and displacement. Biological Conservation, 145(1), 79-85.

Di Vittorio, M., Di Trapani, E., Cacopardi, S., Rannisi, G., Falci, A., Ciaccio, A., Salvo, G. (2017). Population size and breeding performance of the Lanner Falcon *Falco biarmicus* in Sicily: conservation implications. Bird Study, 64(3), 339-343.

Donázar, J. A., Blanco, G., Hiraldo, F., Soto-Largo, E., Oria, J. (2002). Effects of forestry and other land-use practices on the conservation of cinereous vultures. Ecological Applications, 12(5), 1445-1456.

Gavashelishvili, A., McGrady, M. J., Javakhishvili, Z. (2006). Planning the conservation of the breeding population of cinereous vultures *Aegypius monachus* in the Republic of Georgia. Oryx, 40(1), 76-83.

Green, R. E., Newton, I. A. N., Shultz, S., Cunningham, A. A., Gilbert, M., Pain, D. J., Prakash, V. (2004). Diclofenac poisoning as a cause of vulture population declines across the Indian subcontinent. Journal of Applied Ecology, 41(5), 793-800.

Güner, Ş. T., Yücel, E. (2015). The relationships between growth of *Pinus sylvestris* ssp. hamata forests with ecological factors in Central Anatolia. Biological Diversity and Conservation, 8(3), 06-19.

Heredia, B. (1996). Action plan for the Cinereous Vulture in Europe, (Compiled by: Heredia, B., with Contrubutors), Bird Life International (on behalf of the European Commission), U.K.

Jiménez-Franco, M. V., Martínez, J. E., Calvo, J. F. (2014). Patterns of nest reuse in forest raptors and their effects on reproductive output. Journal of Zoology, 292(1), 64-70.

Kirazlı, C., Yamaç, E. (2013). Population size and breeding success of the Cinereous Vulture, *Aegypius monachus*, in a newly found breeding area in western Anatolia (Aves: Falconiformes). Zoology in the Middle East, 59(4), 289-296.

Kovács, A., Mammen, U.C.C., Wernham, C.V. (2008). European monitoring for raptors and owls: state of the art and future needs. Ambio, 37(6): 408–412.

Morán-López, R., Sánchez Guzmán, J. M., Borrego, E. C., Sanchez, A. V. (2006a). Nest-site selection of endangered cinereous vulture (*Aegypius monachus*) populations affected by anthropogenic disturbance: present and future conservation implications. Animal Conservation, 9(1), 29-37.

Morán-López, R., Sánchez, J. M., Costillo, E., Corbacho, C., Villegas, A. (2006b). Spatial variation in anthropic and natural factors regulating the breeding success of the cinereous vulture (*Aegypius monachus*) in the SW Iberian Peninsula. Biological Conservation, 130(2), 169-182.

Moreno-Opo, R., Fernández-Olalla, M., Margalida, A., Arredondo, Á., Guil, F. (2013). Influence of environmental factors on the breeding success of Cinereous Vultures *Aegypius monachus*. Acta Ornithologica, 48(2), 187-193.

Moreno-Opo, R., Margalida, A. (2014). Conservation of the Cinereous Vulture *Aegypius monachus* in Spain (1966–2011): a bibliometric review of threats, research and adaptive management. Bird Conservation International, 24(2), 178-191.

Ogada, D. L., Keesing, F., Virani, M. Z. (2012). Dropping dead: causes and consequences of vulture population declines worldwide. Annals of the New York Academy of Sciences, 1249(1), 57-71.

Ogada, D., Shaw, P., Beyers, R. L., Buij, R., Murn, C., Thiollay, J. M., Krüger, S. C. (2016). Another continental vulture crisis: Africa's vultures collapsing toward extinction. Conservation Letters, 9(2), 89-97.

Özcan A.U., Yamaç, E. (2015). Kara akbaba (*Aegypius monachus* L. 1766)'nın Kuzey İç Anadolu Bölgesi'ndeki yaşama alanları ve populasyon büyüklüğünün tespiti. 2023'e Doğru 3. Doğa ve Ormancılık Sempozyumu, Antalya.

Parvanov, D., Stoynov, E., Vangelova, N., Peshev, H., Grozdanov, A., Delov, V., Iliev, Y. (2018). Vulture mortality resulting from illegal poisoning in the southern Balkan Peninsula. Environmental Science and Pollution Research, 25(2), 1706-1712.

Poirazidis, K., Goutner, V., Skartsi, T., Stamou, G. (2004). Modelling nesting habitat as a conservation tool for the Eurasian black vulture (*Aegypius monachus*) in Dadia Nature Reserve, northeastern Greece. Biological conservation, 118(2), 235-248.

Reading, R. P., Kenny, D., Azua, J., Garrett, T., Willis, M. J., Purevsuren, T. (2010). Ecology of Eurasian black vultures (*Aegypius monachus*) in Ikh Nart nature reserve, Mongolia. Exploration into the Biological Resources of Mongolia, 11, 177-188.

Sergio, F., Newton, I. A. N. (2003). Occupancy as a measure of territory quality. Journal of Animal Ecology, 72(5), 857-865.

Skartsi, T., Elorriaga, J. N., Vasilakis, D. P., Poirazidis, K. (2008). Population size, breeding rates and conservation status of Eurasian black vulture in the Dadia National Park. Journal of Natural History, 42 (5-8), 345-353.

Skartsi, T., Elorriaga, J. N., Vasilakis, D. P. (2010a). Eurasian Black Vulture: the focal species of the Dadia–Lefkimi–
Soufli Forest National Park. G. Catsadorakis, and H. Källander, (eds). The Dadia–Lefkimi–Soufli Forest National Park, Greece: Biodiversity, Management and Conservation. WWF Greece, Athens, pp. 195-206.

Skartsi, T, Vasilakis, D. P., Elorriaga, J. N. (2010b). Population trends and conservation of vultures in the Dadia–Lefkimi–Soufli Forest National Park. G. Catsadorakis, and H. Källander, (eds). The Dadia–Lefkimi–Soufli Forest National Park, Greece: Biodiversity, Management and Conservation. WWF Greece, Athens, pp. 183-193.

Väli, Ü. (2015). Monitoring of spotted eagles in Estonia in 1994–2014: Stability of the lesser spotted eagle (*Aquila pomarina*) and decline of the greater spotted eagle (*A. clanga*). Slovak Raptor Journal, 9(1), 55-64.

Vasilakis, D. P., Whitfield, D. P., Kati, V. (2017). A balanced solution to the cumulative threat of industrialized wind farm development on cinereous vultures (*Aegypius monachus*) in south-eastern Europe. PloS one, 12(2), e0172685.

Virani, M. Z., Kendall, C., Njoroge, P., Thomsett, S. (2011). Major declines in the abundance of vultures and other scavenging raptors in and around the Masai Mara ecosystem, Kenya. Biological Conservation, 144(2), 746-752.

Vlachos, C. G., Bakaloudis, D. E., Holloway, G. J. (1999). Population trends of Black Vulture *Aegypius monachus* in Dadia Forest, north-eastern Greece following the establishment of a feeding station. Bird Conservation International, 9(2), 113-118.

Yamaç, E. (2006). Studies on Black Vulture (*Aegypius monachus* L.) population in Eskişehir, Northwest Turkey. International Congress on the Zoogeography and Ecology of Greece and Adjacent Regions., Patra, Greece.

Yamaç, E., Günyel, E. (2010). Diet of the Eurasian Black Vulture, *Aegypius monachus* Linnaeus, 1766, in Turkey and implications for its conservation: (Aves: Falconiformes). Zoology in the Middle East, 51(1), 15-22.

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