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# New Breeding Site of Eleonora's Falcon (*Falco eleonorae*) and Peregrine Falcon (*Falco peregrinus*) in Southern Turkey

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**Abstract**

In southern Turkey, safety cliffs and islands provide breeding and stopover sites for falcons. But, there is scarce information about their distribution in these regions. In this work, Peregrine falcon (*Falco peregrinus*), Eleonora's falcon (*Falco eleonorae*), Merlin (*Falco columbarius*) and Eurasian Hobby (*Falco subbuteo*) were identified in the studied area. The study was conducted around Adrasan bay on the coast line of southern Turkey from April to October during 2013-2018. The Eleonora's falcon and the Peregrine falcon have successfully bred in this region, regularly. A large breeding colony of the Alpine swift (*Apus melba*) is located close to cliffs in the study area. Both falcon species had many successful attacks on Alpine swifts in the sea. This food abundance may be effective with the safety nesting areas for both Peregrine falcon and Eleonora's falcon.

***Keywords:*** Eleonora's falcon; Migration; Nesting; Peregrine falcon; Southern Turkey.

## Türkiye'nin Güneyinde Ada Doğanı (*Falco eleonorae*) ve Gökdoğan (*Falco peregrinus*) Yeni Üreme Alanı

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**Öz**

Türkiye'nin güney kıyı kesiminde yer alan kayalık alanlar ve adalar doğanlara güvenli üreme ve konaklama alanı oluşturmaktadır. Ancak, bölgede bu türlerin yayılışları hakkında yeterli bilgi bulunmamaktadır. Bu çalışmada, Gökdoğan (*Falco peregrinus*), Ada doğanı (*Falco eleonorae*), Boz doğan (*Falco columbarius*) ve Delice doğan (*Falco subbuteo*) belirlenmiştir. Çalışma, 2013-2018 yıllarında Nisan Ekim ayları arasında Türkiye'nin güney kıyılarında Adrasan körfezi çevresinde gerçekleştirilmiştir. Ada doğanı ve Gökdoğan bölgede düzenli olarak başarılı bir şekilde üremiştir. Çalışma alanındaki kayalıklara yakın bir bölgede büyük bir Akkarınlı ebabil (*Apus melba*) üreme kolonisi bulunmaktadır. Her iki Doğan türü de Akkarınlı ebabillere deniz ve ada üstünde saldırılarda bulunmuş, bazılarında başarılı olarak avlandıkları gözlenmiştir. Bu önemli besin bolluğu Gökdoğan ve Ada doğanının bölgeyi güvenli üreme alanı olarak tercih etmesinde etkili olabilir.

***Anahtar kelimeler*:** Ada doğanı; Göç; Yuvalanma; Gökdoğan; Güney Türkiye.

## 1. Introduction

The coastal line of the western and southern Turkey provides safe resting areas for some migratory birds besides the opportunity for nesting and foraging. Many birds of Prey such as Peregrine falcon (*Falco peregrinus*) and Eleonora's falcon (*Falco eleonorae*) migrate to these areas between breeding and wintering grounds. The Eleonora's falcon breeds in a narrow corridor around the Mediterranean and the eastern Atlantic, from the Canary Islands to the coast of Morocco [1, 2] whereas the Peregrine falcon has a widespread breeding range.

Both falcon species are long-distance migrants that overwinter in Sub-Saharan regions. They mostly use high cliffs for nesting. European breeding populations migrate to their breeding grounds by following different routes viz., Iberian peninsula populations trekk via Tunisia to the south-eastern areas [3], in contrast Aegean Sea populations migrate across the Mediterranean direct to the South [4]. Western and southern Turkey have safe breeding and stopover cliffs and islands for breeding falcons. Information about their distribution in these regions is however scarce. In this study, the new breeding sites of Peregrine falcon and Eleonora's falcon were investigated in south-western Turkey.

## 2. Materials and Methods

The study was conducted around Adrasan bay along the coast line of southern Turkey (36°18'N, 30°28'E) (Fig. 1). This area covers about 30 km of sea cliffs and small rocky islands. Field observations were carried out between April-October during 2013-2018. Data were

collected once a week in April, May and October, and twice a week during the breeding season i.e. from June to September. Daily observations were recorded while travelling in a boat mostly in the evenings, when the birds were generally more active at this time of the day. After finding nests, active nests were checked regularly and tried to find nesting sites by observing other birds. The data are given in Fig. 2. Certain nests were recognized when the birds observed on the nest, whereas Possible nesting areas within the territory where birds were no observed to indulge in breeding activities.

**Figure 1:** The location of the study area

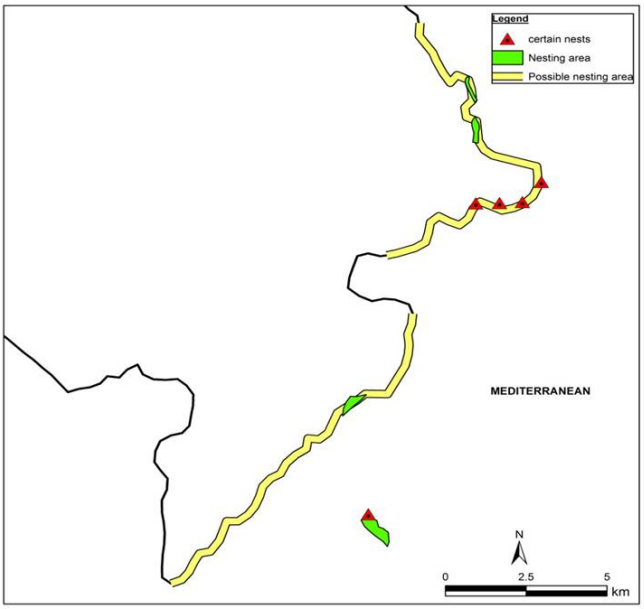


**Figure 2:** The breeding distribution of falcons. Red triangle shows the nests, which were definitely found and monitored, green colored areas indicate observed pairs but the nest couldn't found, yellow colored areas are also sea cliffs and possible nesting areas

## 3. Results

During the six-year study, four falcon species were observed to visit the area from April to October viz., Peregrine falcon (*Falco peregrinus*), Eleonora's falcon (*Falco eleonorae*), Merlin

(*Falco columbarius*) and Eurasian Hobby (*Falco subbuteo*). Merlin and Eurasian Hobby are the passing migrants visiting only during in spring and autumn, whereas Peregrine falcon and Eleonora's falcon remain in the area from April to October (Table 1).

**Table 1:** Observation results of four falcon species according to the months and years

| | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
|---|---|---|---|---|---|---|
| **April** | E,H,M,P | E,H,M,P | E,H,M,P | E,H,M,P | E,H,M,P | E,H,M,P |
| **May** | E,H,P | E,H,M,P | E,H,P | E,H,P | E,H,P | E,H,P |
| **June** | E,P | E,P | E,P | E,P | E,P | E,P |
| **July** | E,P | E,P | E,P | E,P | E,P | E,P |
| **August** | E,P | E,P | E,P | E,P | E,P | E,P |
| **September** | E,H,M,P | E,M,P | E,H,M,P | E,H,M,P | E,H,M,P | E,M,P |
| **October** | E,H,M,P | E,H,M,P | E,H,M | E,H,M,P | E,H,M,P | E,H,M,P |

Capital letters in columns indicate observed falcon species. E: Eleonora's falcon, H: Eurasian hobby, M: Merlin, P: Peregrine falcon.

The Eleonora's falcon and the Peregrine falcon have successfully bred on this region, regularly. The number of brood pairs of both species has been variable in different years, however at least two nests of Eleonora's falcon and one nest of Peregrine falcon had nestlings every year during the study period (Table 2).

**Table 2:** The number of pairs (nests) of Eleonora's falcon and Peregrine falcon according to the years

| | | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
|---|---|---|---|---|---|---|---|
| **Eleonora's falcon** | Certain | 3 | 3 | 2 | 2 | 3 | 3 |
| | Observed | 5 | 5 | 5 | 5 | 5 | 5 |
| **Peregrine falcon** | Certain | 1 | 1 | 2 | 2 | 1 | 2 |
| | Observed | 2 | 2 | 3 | 3 | 3 | 3 |

Certain, the nest were definitely found; Observed, the nest couldn't find but the pairs were observed around the cliffs.

Eleonora's falcon pairs regularly used the same three nesting sites in 2013 and 2014, but in 2015 pairs did not use the nesting cliff and occupied another site not so far from that used in previous years. Every year five pairs were observed, but only two or three successful nests could be found on the cliffs by using binoculars. Similarly, the Peregrine falcons bred on the cliffs in the same area. The highest pair number was three in all the years during the study period, but mostly just one nest could be found. The number of eggs and hatchlings from each nest could not be determined while observing from the boat. Whereas some young falcons could be observed on their nests, the number of successful fledglings could not be determined (Fig. 3).

**Figure 3:** Fledglings of Peregrine falcon (*Falco peregrinus*) standing on the slot entry

## 4. Discussion

Eleonora's falcon mainly breeds on the cliffs of small islands in the Mediterranean in large colonies of up to 630 pairs (Morocco) [3]. According to [5], estimated breeding pairs are 12,299 only on the islands of the Aegean and this is 90% of the World's population of Eleonora's falcon. However, there is only one local study report (unpublished) about the distribution and the breeding site of the species in western (Aegean Sea Region) Turkey.

Several falcon species feed on insects [6], Peregrine falcon feeds on medium-sized birds such as pigeons and doves, waterfowl, songbirds, waders and mammals such as ground squirrels [7-9], according to [1] Eleonora's falcon feeds on primarily insects, but also hunts small migratory birds above the sea. Although there is insufficient information about insects and birds diet of Eleonora's falcon, it is successful in hunting such as wagtails rather than swift species [10]. The study area has a big breeding colony of over 2000 pairs of the Alpine swift (*Apus melba*), on the Pırasalı Island close to the cliffs [11]. Unlike the results of [10], many successful attacks on Alpine swifts were observed during their flights on the sea or above the island near their breeding area. On the other hand, this Alpine swift colony spend pre- and post-breeding time including breeding period longer than northern populations between March and the end of October [12]. Besides the safe nesting areas on the cliffs, food abundance is one of the important features to decide on the

establishment of territories. The number of breeding pairs is not high in comparison to other Eleonora's falcon colonies in the Mediterranean. However, the area is covered with different sized islands and more cliffs. The data about the distribution and breeding pairs of falcons are unsatisfactory. However, this result may help to understand the interactions of falcons and swifts, especially during breeding periods and breeding success of both species groups. Moreover, Peregrine falcon and Eleonora's falcon migrate to the eastern Africa or Madagascar for wintering [2, 13] and Pırasalı Island population of Alpine swift use eastern Africa as wintering grounds [12]. The result of this study is the preliminary of understanding migration and breeding behavior of these species in the eastern Mediterranean.

**References**

[1] Walter, H., Eleonora's falcon. Adaptations to prey and habitat in a social raptor. Chicago, IL: University of Chicago Press, 1979.

[2] Gschweng, M., Kalko, E.K.V., Querner, U., Fiedler, W. and Berthold, P., *All across Africa: highly individual migration routes of Eleonora's falcon.* Proceedings of the Royal Society B, 275:2887-2896, 2008**.**

[3] Lopez-Lopez, P., Liminana, R. and Urios, V., *Autumn migration Eleonora's falcon Falco eleonorae tracked by satellite telemetry.* Zoological Studies, 48(4):485-491, 2009.

[4] Kassara, C., Fric, J., Gschweng, M. and Sfenthourakis, S., *Complementing the puzzle of Eleonora's falcon (Falco eleonorae) migration: new evidence from an eastern colony in the Aegean Sea.* Journal of Ornithology, 153:839-848, 2012.

[5] Dimalexis, A., Xirouchakis, S., Portolou, D., Latsoudis, P., Karris, G., Fric, J., Georgiakakis, P., Barboutis, C., Bourdakis, S., Ivovic, M., Kominos, T. and Kakalis, E., *The Status of Eleonora's falcon (Falco eleonorae) in Greece*. Journal of Ornithology, 149:23-30, 2008.

[6] Del Hoyo, J., Elliot, A. and Sargatal, J., Handbook of the birds of the world. Volume 2, New World Vultures to Guineafowl. Lynx Edicion, Barcelona, 1996.

[7] Bradley, M. and Oliphant, L.W., *The diet of peregrine falcons in Rankin Inlet, Northwest territories: An unusually high proportion of mammalian prey,* The Condor, Vol:93, (1): 193-197, 1991.

[8] Rockenbauch, D., Der Wanderfalke in Deutchland und umliegenden Gebieten. Band 2. Koch, Reutlingen, 2002.

[9] Drewitt, E.J.A. and Dixon, N., *Diet and prey selection of urban-dwelling peregrine falcons in southwest England,* British Birds, 101: 58-67, 2008.

[10] Ristow, D., On the insect diet of Eleonora's falcon Falco eleonorae and its importance for coloniality. In *Raptors worldwide* (eds R. D. Chancelor & B.-U. Meyburg), Berlin, Germany, pp. 705-712, 2004.

[11] Karaardıç, H., Köse, F. and Kocakahya, V., *Pırasalı Island: Paradise of Alpine swift (Apus melba) in Adrasan, Kumluca, Turkey.* Tabiat ve İnsan, June:3-10, 2013.

[12] Meier, C., Karaardıç, H., Aymi, R., Peev, S.G., Baechler, E., Weber, R., Witvliet, W. and Liechti, F., *What makes Alpine swift ascend at twilight? Novel geolocators reveal year-round flight behaviour.* Behavioral Ecology and Sociobiology, (2018) 72: 45, 2018.

[13] Mellone, U., Lopez-Lopez, P., Liminana, R. and Urios, V., *Wintering habitats of Eleonora's falcon Falco eleonorae in Madagascar.* Bird Study, 59:1, 29-36, 2012.