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Distribution, Population and Threats of Lesser Spotted Eagle *Aquila pomarina* in Iran

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Abstract

As a legally protected species, the Lesser Spotted Eagle *Aquila pomarina* (LSE) is migratory-breeding and migratory species occurring in small numbers in Iran throughout the year. Due to the lack of regular monitoring of the species in the country, there are gaps concerning the distribution and population size of the species. According to data collected from April 2011 to Sep 2017, spring migration occurs in April – May, and autumn migration in September. Most of the LSE population in Iran is distributed in the suitable areas across the Caspian Sea lowlands and adjacent northern slopes of the Alborz Mountains, north of Iran, and in western slopes of Zagros Mountains in western parts of the country, as well as Central Iran. The population increases in after breeding season and arrival of migrants. As an example, more than 50 individuals were observed in Jahan Nama Protected Area, south east of Caspian Sea forests on 23 Sep, 2016. The first breeding of the LSE was recorded in Savad Koh, Mazandaran Province, chick and parents left the nest in the early of September 2017. The main threats to the species are habit loss and degradation by conversion into rice field, vegetable and unsustainable forestry. Logging in old-growth Caspian Hyrcanian forests and selective cutting of old trees lead to the destruction of the habitats. Moreover, the use of high quantities of pesticides in rice fields and monocultures causes to a decrease in the numbers of key prey species. In addition to poisoned baits and electrocution, human disturbance by tourists and hikers as well as illegal hunting can also threat Eagles. It is essential to develop a National Action Plan for management and conservation of LSE in Iran in order to establish a monitoring program for the species and its habitats, and to promote its conservation level.

Key words: Lesser Spotted Eagle, migratory, Caspian Hyrcanian forests, population, Iran

1. Introduction

The Lesser Spotted Eagles (LSE) *Aquila pomarina* (Brehm 1831) is a medium-sized Eagle and closely similar to Greater Spotted Eagle *Aquila clanga*, the sexes are similar with no seasonal variations (Cramp & Simmons, 1980). The species is common during summer across the Western Palearctic regions and winter in the Ethiopian regions (Cramp & Simmons, 1980; Meyburg, 1994). To the west of the distribution range of the LSE there are a few migrating and breeding habitats in Spain. (Bosch & Meyburg, 2012). In the north of this area the border of LSE geographic range goes through North-east Germany, in the east the species can be traced up to Western Russia. Southwards the LSE is found in Slovenia, Croatia, Greece, Eastern Turkey and North Iran (Meyburg, 1994; Meyburg *et al.*, 2004; Treinys *et al.*, 2007). In late summer, the LSE start its migration to the wintering grounds in Ethiopian regions to the warmer climates of South Africa and Mozambique. The specific location of their wintering habitats is depending on the location of their breeding habitats (Meyburg, 1994).

During the breeding season, LSE breeding areas are in West, Central and East Europe and south-eastwards to northern Iran (Meyburg, 1994; Treinys *et al.*, 2007; Mirski, 2009; BirdLife International, 2017). The breeding range covers the West of Europe in Spain (Bosch & Meyburg, 2012), eastern part of Central Europe, western Russia and the Baltic states. In the southeast the LSE is found in the Balkans and throughout Turkey as far as the Caucasus and the South Caspian Sea in Iran (Meyburg, 1994; BirdLife International, 2017). The world population consists of only about 40,000 – 60,000 individuals in extent of occurrence including breeding and resident habitats of 5,340,000 km² (Fig. 1., BirdLife International, 2017).

The population numbers of this species has never been a topic of research and there is insufficient information available on the extent of the easterly distribution range in Iran. The species has recently been found somewhat further west in Iran than was reported earlier. In this paper we present the latest data of LSE in Iran, give an up-to-date data on its numbers and discuss the distribution and threats. Our specific objectives includes: a) population size based on recent sightings, b) mapping its present distribution and C) reporting the threats. This knowledge could subsequently be used in the conservation and monitoring of this species in Iran.



Fig. 1. Distributions of Lesser Spotted Eagles in the Palearctic and Ethiopian regions (Birdlife International 2017, Downloaded from <http://www.birdlife.org> on 09/10/2017)

2. Material and Methods:

Study Area: Data of the distribution, population sizes and threats of LSE were collected throughout Iran from Hyrcanian Forests ecoregion, Zagros Mountain, Central and South of Iran during May 2011 to September 2017. The Caspian Hyrcanian Forests ecoregion is an area of lush lowland and mountain forests covering about 55,000 K² near the southern shores of the Caspian Sea of Iran and Azerbaijan. Hyrcanian ecoregion in Iran includes the coast along the Caspian Sea and the northern slopes of the Alborz Mountains. It covers parts of five provinces of Iran from east to west including North Khorasan, Golestan, Mazandaran, Gilan and Ardabil Provinces. The Zagros Mountains form the largest mountain range in Iran, Iraq and southeastern Turkey. This mountain range has a total length of 1,500 km². One key habitat type is Zagros Mountain Forest and host high level of bird diversity in the West of Iran.

Field Survey: No specific survey or monitoring program regarding LSE has been carried out in Iran so far. The LSE observations mostly at the Protected Areas made by the Game Guards and Experts of the Department of Environment (DOE) of Iran, who are in charge of conservation of wildlife in the country, as well as the LSE sightings recorded by birdwatchers during recent years were taken into account. Injured or disabled LSEs rescued by local people and transferred to the DOE offices for treatment and recovery process were considered to find out and assess the main threats to the species in the country. The species distribution maps of "The Atlas of the birds of Iran" (Kaboli, 2012) published in 2016 as well as "A field Guide to the birds of Iran" (Mansoori, 2001) were used as references.

3. Results and Discussions:

The Lesser Spotted Eagle is a regular summer visitor in small numbers to the Caspian forests, north of Iran, and breed there as its most eastern distribution range in the world. Although LSE is legally protected in the country, not any field survey or regular monitoring plan for LSE population has been carried out in Iran. So, there are gaps of knowledge regarding distribution and population size of the species. In Iran, the species is usually observed in small numbers throughout the year across the Caspian moist lowlands, prefers marshy forests, extensive woodlands near open grasslands, damp meadows, floodplains and wetlands, mostly distributed in very small numbers along the forests of Alborz Mountains stretched from southeast to southwest of Caspian Sea, north of Iran, in suitable areas of five provinces of Khorasan Shomali, Golestan, Mazandaran, Gilan and Ardebil. They are mostly seen solitary or in pairs at the forests next to the undulated dry land farming areas or rice paddies, but occurs in medium-sized flocks on migration.

The species also occurs throughout the year in western slopes of dry mountain woods of Zagros, Ilam and Kordestan provinces, in western parts of the country. In addition, there are some occasional and sporadic records of sightings of the species in central and southern parts of Iran namely the provinces of Tehran and Fars.

In the north of Iran, Caspian Region, birdwatchers have made the following observations:

- One adult in Ali Abad forest, Golestan province, next to the Rice paddies, 4 May 2017
- One Juvenile in Kord Kooy, Golestan province, 6 July 2017
- Two adults and one juvenile in Savad Kooh, Mazandaran Province, September 2017

- Two adults in Hezar Jerib, Mazandaran province, 14 Sep 2017
- One adult in Savaad Kooh, Mazandaran province, 19 May 2017
- One adult in Jokandan marsh, Gilan province, late September 2017 & 2016. The bird was there during summer 2017, too.
- 50 individuals in Jahan Nama Protected Area, Golestan province, 23 Sep 2016
- One adult in Savad Kooh, Mazandaran Province, 4 June 2016
- One adult in Gomishan International wetland, Golestan province, Oct. 2013

In addition, according to the reports from the Department of Environment provincial offices of Ilam and Kordestan, following observations were made during recent years.

- In Dinar kooh Protected Area, Abdanan, overall 15 individuals were observed at December 2011, overall 112 individuals in several flocks during two weeks in July 2011, 3 individuals in early May 2013, and 5 individuals in mid-March 2014.
- In Kabir Kooh Protected Area, 2 individuals in May 2013.
- According to the birdwatchers reports, at least 8 individuals were seen in Marivan forests, Kordestan province, during spring and summer every year, but vagrant birds in early autumn and late winter.

Available collected data and information indicates that LSE is present in the country throughout the year, while their population increases after breeding season, namely from September when the migrants leave their breeding areas in other countries probably north of Iran, and migrate southward to suitable areas in Iran for wintering or passage. It means that there is at least small population of LSE in the country during breeding season, and juveniles have been observed in the north of the country at least twice during recent years.

- **Threats:**

As a consequence of large- scale changes in land use and habitat loss processes, a serious decline of this species has been noted during recent years in Europe, Probable causes of the decline were indicated to be overgrowth of vegetation on meadows, agriculture intensification, loss of nest sites caused by forestry practices and increase in aggressive species such as White-tailed Eagle, *Haliaeetus albicilla* (Treinys *et al.* 2007; Meyburg *et al.* 2004; Meyburg *et al.* 2001). Moreover, the LSE is known as a strongly philopatric bird (Meyburg *et al.* 2005). So, there are low chances that recolonization of the old territories occurs, once the optimal habitat is damaged.

Habitat destruction and deterioration through logging in marginal forests, logging old-growth Caspian Hyrcanian forests and selective cutting of old trees, conversion of marginal forests into rice field, road and settlements, as well as unsustainable forestry can be considered as one of the most important threatening factors to the species and its habitats. Moreover, rather frequent collisions of the bird to the electricity transmission network lead to the species mortality or damage. Application of poisoned baits, high quantities of pesticides and fertilizers in the rice fields and monocultures cause to a decrease in the number of both the species and key prey species. In some cases, poisoning and contagious diseases hurts and damage the species or cause

mortality among them. From the other side, human disturbance by hikers as well as illegal hunting shouldn't be ignored.

- Suggestion and Recommendation:

In order to remove gaps and increase our knowledge and information regarding the status of LSE in Iran in terms of population size, distribution, movements, and threatening factors to the species and its habitats, it is necessary to develop the National Action Plan for conservation of LSE in the country so that regular monitoring of the species and necessary field surveys to be implemented, and all of the efforts be focused on the conservation measures to the species accordingly.

Table 1. Detailed information on the observations of LSE in Iran from 2011 to 2017

Date	Birds number	Site Name	Province	Locality
4 May 2017	1	Ali Abad Forest	Golestan	Caspian Region
6 July 2017	One Juvenile	Kord Kooy	Golestan	Caspian Region
September 2017	2 adults, 1 juvenile	Savad kooh	Mazandaran	Caspian Region
19 May 2017	1	Savaad Kooh	Mazandaran	Caspian Region
14 September 2017	2	Hezar Jerib	Mazandaran	Caspian Region
Late September & Summer 2017	1	Jokandan marsh	Gilan	Caspian Region
16 September 2016	1	Jokandan marsh	Gilan	Caspian Region
23 Sep 2016	50	Jahan Nama P.A.	Golestan	Caspian Region
4 June 2017	1	Savad kooh	Mazandaran	Caspian Region
Oct. 2013	1	Gomishan Int. Wetland	Golestan	Caspian Region
December 2011	15	Dinar kooh P.A.	Ilam	West Iran
July 2011	112 (in 2 weeks)	Dinar kooh P.A.	Ilam	West Iran
Early May 2013	3	Dinar kooh P.A.	Ilam	West Iran
Mid-March 2014	5	Dinar kooh P.A.	Ilam	West Iran
May 2013	2	Kabir Kooh P.A.	Ilam	West Iran
Spring and Summer recent years	8 – 10	Marivan Forests	Kordestan	West Iran
Early Autumn and late Winters	1 – 2 vagrant	Marivan Forests	Kordestan	West Iran



Fig. 1: Map of the presence of Lesser Spotted Eagle in Iran (Kaboli 2012 and recent observations)



Fig. 2: Lesser Spotted Eagle nesting area in Mazandaran Province, 19th May 2017. Photo: A. Habibi Azad



Fig. 3: Lesser Spotted Eagle in breeding area, Savad kooch, mazandaran Provinve, Sep. 2016. Photo: M. Sayyad (Aghili).



Fig. 4: Lesser Spotted Eagle, Aliabad, Golestan Provinve, 4th May 2017. Photo: B. Galeshi.



Fig. 5: Lesser Spotted Eagle, Talesh, Jokandan Wetland, Gilan Province, 16th Sep 2017. Photo: F. Naziri



Fig . 6: Lesser Spotted Eagle, Kiasar, Mazandaran Province, 2010. Photo: K. Rabiei

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