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Determination Conservation Priority Areas and Taxa in Terms of Birds: The Case of Aksaray

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Highlights:

- Hamidiye/Alaca, Ataköy/Darlıhüyük and Sultanhanı have been determined as priority locations for conservation,
- These locations are represented by three different habitat types,
- Of the detected indicator species, four are in NT and one is in the VU threat category.

Keywords:

- Protection,
- Steppe,
- Swamp,
- Wetland

ABSTRACT:

Growing environmental challenges worldwide and the lack of resources to tackle them require conservationists to set priorities for action. As known; protected areas will be needed as species change their distribution over time due to global climate change, drought, and complete habitat destruction. Although; conservation targets have been met for most species, some conservation features remain unprotected, especially for threatened bird species. There are certain habitat types in Aksaray province where target species belonging to different bird groups are concentrated. Herein; we identify these priority areas for conservation for the current and future estimated distributions of bird species. For this purpose; field studies have been carried out for two years (2015-2017) to represent different habitat types besides bird species detected within the borders of the province. According to our findings; three different habitats (wetland, swamp, and steppe) rich in target species were determined as priority areas for protection. In addition, five different bird species (*Vanellus vanellus*, *Limosa limosa*, *Numenius arquata*, *Circus macrourus*, *Streptopelia turtur*) observed in these habitats are in the Vu (Vulnerable) and NT (Near Threatened) categories according to the International Union for Conservation of Nature (IUCN) Red List. As a result; both the protection and monitoring of the identified habitats and taxa that directly reflect the health of the habitat will facilitate the sustainability of priority areas in future. This study could be a resource for future regulation of conservation strategies.

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INTRODUCTION

Considering the distribution of birds, it is seen how biodiversity distributed worldwide and that birds play an indicator role in global environmental changes (BirdLife International, 2008). Because they are susceptible to environmental change, which makes them suitable model organisms for habitat changes (Xu et al., 2018). Besides; birds provide many essential ecosystem services such as nutrient cycling, biodegradation, pest control, plant fertilization and seed separation (Şekercioğlu, 2006; Anderson et al., 2011). Around the world; there are approximately 10900 bird species (Gill and Donsker, 2020; Yavuz et al., 2021). Although; the ecology and distribution of each species differ, birds found in different habitats, from deserts to mountains. Some of these species are specialized in very characteristic habitats and are distributed in limited areas (BirdLife International, 2008). Studies to identify bird species and essential regions for birds in Turkey began in the 1800s. The first information about Anatolian birds were found in the study of Danford (1880). In addition; Kirwan et al. (1998) noted that there are 453 bird species in Turkey; adding, 12 more to these species, and the number could rise to 465. When; we look at the most recent studies in Turkey, Kiziroğlu (2008; 2009) determined the number of bird species in Turkey as 437 as a result of his research, while this figure increased to 503 together with the random and controversial (under-recorded) species (Çelik, 2018).

Turkey is extremely rich in biodiversity due to its geographical location and diversity of landforms (Kiziroğlu et al., 2013). Our country is an excellent land bridge for migrating species between Asia, Europe and Africa. It is on the primary migration route for many gliding bird species that breed in the Palearctic, winter in Africa, and migrate (Lott, 2002). Bird species migrate over our country to reach the wintering areas in the north to breed in the spring and in the south of our country in the autumn. The reasons for the high bird diversity in Turkey are that it has different habitats, it is located on bird migration routes, and the high number of wetlands (Kiziroğlu et al., 2013).

Aksaray province has many different geographical areas with various habitat types, such as fresh and saltwater lakes, forests and agricultural areas similar to the general situation of our country. The habitats sought by each bird species are different, and Aksaray province contains habitats that will meet the needs of many bird species. However; except for the Ihlara Special Environmental Protection Area Biodiversity Detection Project, Salt Lake Special Environmental Protection Area Species and Habitat Conservation and Monitoring Project and Aksaray Environmental Status Report, no other studies were encountered in the study area. The purpose of the study is to determine the habitats that birds frequently prefer as a result of the field studies carried out between 2015-2017.

MATERIALS AND METHODS

Fieldwork

Fieldwork was carried out for 47 days over two years (2015-2017) in Aksaray, representing the main habitat types such as forest, high mountain, steppe, wetland, dune, agriculture and settlement. Bird species in the visited habitats were detected using binoculars and telescopes. In addition to the telescope and binoculars, birds and habitats were photographed with the camera. Fieldwork was carried out from the early hours before sunrise to sunset when birds are more active and human activity is the least. However; since the counting and photographing waterfowl are more convenient during the day, the observations were made over the whole day.

Priority Areas and Taxa

Field studies were carried out using the point counting and transect counting methods. Walking paths were determined according to possible breeding sites in habitats such as forests, swamps,

agricultural areas and salt meadows, and a census was made by following these paths. All the birds seen and heard along this line were recorded during the observations. Breeding codes adapted from Hagemeyer and Blair (1997) were used for each observed bird species. While creating the observation records, the priority taxa were determined by entering the protection status of each species. Birdlife International has identified over 12,000 Important Bird and Biodiversity Areas (IBAs) worldwide to protect and conserve bird populations (BirdLife International, 2014). Moreover, these areas are selected based on the following criteria: (i) areas where globally threatened species are regularly held; (ii) areas containing a significant component of a species group whose breeding distribution defines an Endemic Bird Area; (iii) areas containing a significant component of a species group whose distribution is largely or entirely confined to a single biome; and (iv) areas significant for collective species that contain more than 1% of a species' global or biogeographic population or exceed certain thresholds for waterfowl, seabirds or migratory species. The criteria (ii), (iii) and (iv) were not used while determining the habitats of Aksaray province. The Turkish names of the bird species were prepared by considering Kasperek and Bilgin (1996), and the Latin names were prepared by considering the IOC World Bird List (<http://www.worldbirdnames.org/>) (International Ornithological Committee).

RESULTS AND DISCUSSION

Aksaray province includes forest areas such as Salt Lake which is one of the most critical areas of Turkey, and Ekecik and Hasan Mountain which are among the areas with the highest biodiversity. As known; currently, Salt Lake Special Environmental Protection Area in Aksaray has the status of Important Bird Area (IBA), Important Plant Area (IPA) and Important Natural Area due to its biological diversity. The Salt Lake includes one of the important saline steppe habitats and wetlands of Turkey with rare biodiversity. Therefore; this area was excluded from the scope of this study. The biological and geographical diversity seen in Aksaray province causes an increase in the number of species. The photographs obtained as a result of the field studies determined the species diversity and composition of the area. Table 1 listed the most suitable areas identified in this context and the types of indicator species.

Table 1. Three different habitats rich in indicator species with their location

Habitat name	Location (Domain name)	Indicator species
Wetland	Hamidiye/Alaca	<i>Vanellus vanellus</i> (NT)
Swamp	Ataköy/Darlıhüyük	<i>Limosa limosa</i> (NT) <i>Numenius arquata</i> (NT)
Steppe	Sultanhanı	<i>Circus macrourus</i> (NT) <i>Streptopelia turtur</i> (VU)

It was seen that these determined habitats have a vibrant bird fauna together with endangered species, especially during the periods when temporary wetlands were formed. Since; wetlands remain for nearly one month in autumn and three months in spring, it was seen that both the number of species and population density have increased in this period (Erdoğan, 2001). As a result of the field studies carried out during the Salt Lake Special Environmental Protection Area Species and Habitat Conservation and Monitoring Project, three different vegetation types were distinguished depending on the salt concentration in the soil around Salt Lake, namely the Salty Steppe (Steppe) Vegetation, the Salty Barren Vegetation and the Salty Swamp Vegetation.

In the Ihlara Special Environmental Protection Area Biodiversity Detection Project report (April 2012), it was stated that 94 bird species had been detected in Aksaray. None of these species are on the IUCN Red List. However; although there are no priority species for conservation in the area, it has been emphasized that the valley provides an ideal feeding, shelter and hatching environment for many songbird species.

Birds such as Spur-winged Lapwing and Glossy Ibis, which have spent many summers in our country, have been observed in a wetland in Hamidiye/Alaca (Figure 1), especially with the drying of Eşmekaya Marshes, which is an essential environmental area for birds. They are ornithologically rich regions and contain environmental pressures such as animal grazing, poaching and interventions to the water regime.



Figure 1. Wetland habitat-Hamidiye/Alaca

Vanellus vanellus, our indicator species, has beautiful purple colours, although it is not apparent when viewed from afar. They feed on all kinds of insects and spiders. The breeding season begins towards the end of the March. Most of the species are migratory (BirdLife International, 2015). Besides; the population decreases have been observed in the European population. In field studies; it has been recorded most in Hamidiye/Alaca (Figure 2).



Figure 2. Indicator species for Hamidiye/Alaca: *Vanellus vanellus*

The migration status of the *Limosa limosa* (Black-tailed Godwit), an indicator species, is not well known in our country. Because; its breeding areas have been polluted and, or destroyed, it entered the

endangered species list (Trakus, 2012). It was observed in Darıhüyük, - a marsh or flooded area in Aksaray. The species which has not been previously observed in Eşmekaya Marshes, started to nest in areas that were not very suitable for reproduction after this area dried out completely. The other indicator species *Numenius arquata* (Eurasian Curlew) is one of the largest shorebirds, weighing up to 1 kg and immediately attracts attention with its long-curved bill. It is found near all kinds of water, especially grassland areas. The most common place in Aksaray is the temporary wetlands around Ataköy-Darıhüyük.



Figure 3. Swamp habitat-Darıhüyük/Ataköy

The herbaceous plants and shrubs instead of forests form steppe habitats. These areas are generally open to agriculture (Perktaş, 2017). The indispensable species of these habitats are storks. In addition to storks, they are substantial nesting and breeding grounds for species like turtle dove. The *Streptopelia turtur* (European Turtle-Dove), which is in the vulnerable (VU) category of both the global scale and the European population, is an indicator species of the Sultanhanı steppe (Fig. 4). The species are usually active in the early morning and evening and open land and agricultural areas form their habitat. Since; it is a hunting bird, the *Streptopelia turtur* is a good indicator of hunting pressure. (Thomaidis et al., 2022). Due to this intense hunting pressure, the species numbers are decreasing worldwide. Indeed; birds such as partridges and doves have been faced with overhunting, but their viability is controlled according to the decision of the Central Hunting Commission.



Figure 4. Indicator species for Sultanhanı- *Streptopelia turtur* (photographed by Fahri Tunç)

The IBAs contain populations of an internationally essential size of one or more of the five groups (Plants, Mammals, Reptiles, Amphibians, and Inland water fish) belonging to other living taxa. Nearly; one-third of 48 IBAs contain species of global or regional importance including bird species. Besides; the future research will increase the number of essential areas among other living groups. This shows

that the protection of IBAs in Turkey is equivalent to the protection of biological diversity. (Eken et al., 2006).

CONCLUSION

In the habitats visited within the borders of Aksaray province, the biggest threat to the birds is human activities. As a suggestion; the intense human activities should be supervised in the area. In addition; birds such as partridges and doves have been faced with overhunting, but their viability is controlled according to the decision of the central hunting commission. The bird biodiversity of our province has been seriously threatened due to agricultural and livestock activities, road works, expansion of industrial areas and drying of wetlands with drainages, especially around the breeding areas of birds. In addition; in Aksaray, one of the regions with the lowest rainfall in our country, temporary wetlands formed by spring precipitation are important haunts for migrating species. Although; the areas (Ataköy/Darıhüyük vicinity and Hamidiye/Alaca reeds) visited by many species, they dry up entirely as of June and loses this function. For this reason; if these fields are supported with clean water resources and their continuity is ensured, it will be possible for birds to stay in these areas for a more extended period and even to breed.

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Conflict of Interest

The article authors declare that there is no conflict of interest between them.

Author's Contributions

Concept: E.Ç., Design: E.Ç., Ç.A.P., Data Collection or Processing: E. Ç., Analysis or Interpretation: E.Ç., Ç.A.P., Literature Search: E.Ç., Ç.A.P., Writing: E.Ç., Ç.A.P.

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