Bull. Iraq nat. Hist. Mus.
(2019) 15 (4): 381-402
https://doi.org/10.26842/binhm.7.2019.15.4.0381

THE DIURNAL BIRDS OF PREY (RAPTORS) IN THE MESOPOTAMIAN MARSHES OF SOUTHERN IRAQ WITH NOTES ON THEIR CONSERVATION STATUS

Omar F. Al-Sheikhly* and Ahmad J. Al-Azawi

Department of Biology, College of Science, University of Baghdad, Baghdad, Iraq
*Corresponding author: E-mail: alsheikhlyomar@gmail.com

Received Date: 15 July 2019, Accepted Date: 11 September 2019, Published Date: 26 December 2019

ABSTRACT

Birds of prey (Raptors) are top predator avian species that many migrate annually through Mesopotamian marshes in southern Iraq toward their wintering grounds in Arabia and Africa, while others are breeding residents; however, information on their current status is scarce. From January 2016 to April 2019, a total of 20 field expeditions were conducted in the geographical zone of the Mesopotamian marshes, wetlands of international importance. The survey covered the Central Marshes, Al-Hammar and Hawizeh Marsh. One of the objectives of the field surveys is to list the raptors species that wintering and/or migrating through the Mesopotamian marshes and to understand their current spatial and temporal distribution. In the present study, a total of 32 species of diurnal raptors are recorded through intensive field observations, reviewing literature records, and personal communications of unpublished data. Moreover, eight species listed by the International Union for Conservation of Nature IUCN Red List are recorded which highlight the ecological importance of the Mesopotamian marshes as a major stopover site for globally threatened raptors. Besides species persecution, observed threats such as habitat destruction, climate change, and pollution were severely influencing birds of prey communities in the Mesopotamian marshes which warrant further conservation actions.

Keywords: Avifauna, Eagles, Marshes, Mesopotamian, Raptors.

INTRODUCTION

Iraq is geographically situated within three major flyways (East Asia/East Africa Flyway, Central Asia Flyway, and Mediterranean/Black Sea Flyway); therefore, the Mesopotamian marshes (Ahwar) of southern Iraq became an important staging/stopover sites for migratory birds of prey (Boere and Stroud, 2006; Hahn *et al*., 2009; Al-Sheikhly *et al*., 2017). The Mesopotamian marshes of southern Iraq were prioritized as a wetland of international importance among other 33 wetlands known or thought to have been of some concern for migratory birds in Iraq (Scott and Carp, 1982; Scott, 1993). In addition, the Mesopotamian marshes were identified as Important Bird Areas (IBAs) and Iraq's only Endemic Bird Area (EBA) (Evans, 1994; Birdlife International, 2018). Recently, Central Marshes, Al-Hammar, and Hawizeh Marsh were declared as Iraq's first National Park (Mesopotamian National Park MNP), RAMSAR site, and a United Nations Educational, Scientific and Cultural Organization (UNESCO) site (IMOE, 2018).

The diurnal birds of prey (Raptors) in the Mesopotamian marshes

Iraq has a significant number of resident breeding raptor populations and it is one of the range states of many migratory raptors passing through to wintering grounds in Arabia and Africa. However, raptors migration in Iraq was not fully understood; notably, there is scare information on raptors migration in the Mesopotamian marshes of southern Iraq (Al-Sheikhy *et al*., 2017). A total of 38 diurnal raptor species (owls are excluded) were recorded in Iraq (Salim *et al*., 2012). However, according to current taxonomic checklist of avian species in the Middle East, Caucasus and Central Asia, a total of 42 taxa of birds of prey occur in Iraq (Blair *et al*., 2018).

The Mesopotamian wetlands of southern Iraq have a significant importance for wintering raptors; according to Allouse (1960), a total of 22 diurnal raptor species were recorded within and around the geographical zone of the Mesopotamian marshes of southern Iraq. In mid-winter waterfowl survey, 15 raptor species were recorded in January-February 1979. The recorded species were: 12 Western Osprey *Pandion haliaetus* (Linnaeus, 1758), 429 Black Kite *Milvus migrans* (Boddaert, 1783), five White-tailed Eagle *Haliaeetus albicilla* (Linnaeus, 1758), three Cinereous (Black) Vulture *Aegypius monachus* (Linnaeus, 1766), three Eurasian Sparrowhawk *Accipiter nisus* (Linnaeus, 1758), 286 Western Marsh Harrier *Circus aeruginosus* (Linnaeus , 1758), 18 Pallid Harrier *C. macrourus* (S. G. Gmelin, 1770), one Hen Harrier *C. cyaneus* (Linnaeus, 1766), 141 Long-legged Buzzard *Buteo rufinus* (Cretzschmar, 1829), 24 Greater Spotted Eagle *Clanga* (*Aquila*) *clanga* (Pallas, 1811), 12 Steppe Eagle *Aquila nipalensis* (Hodgson, 1833), 34 Eastern (Asian) Imperial Eagle *A. heliacal* (Savigny , 1809), 126 Common Kestrel *Falco tinnunculus* (Linnaeus , 1758) , seven Merlin *F. columbarius* (Linnaeus, 1758), and six Peregrine Falcon *F. peregrines* (Tunstall, 1771) (Scott and Carp, 1982; Scott, 1995).

During May 2004-May 2005, a total of six raptor species were recorded in three restored marshes (Huwayzah, Suq Shuyukh, and East-Hammar marshes) (Abed, 2007); the recorded species were Western Marsh Harrier, Hen Harrier, Eurasian Sparrowhawk, Greater Spotted Eagle, Steppe Eagle, and Golden Eagle *Aquila chrysaetos* (Linnaeus, 1758).

Salim *et al*. (2009) listed nine raptor species among the avifauna of lower Mesopotamian marshlands of southern Iraq that observed in 2005-2008; the listed species were Common Kestrel, Western Marsh Harrier, Black-winged Kite *Elanus caeruleus* (Desfontaines, 1789), Long-legged Buzzard, Hen Harrier, Eurasian Sparrowhawk, Greater Spotted Eagle, Steppe Eagle, and Asian Imperial Eagle.

In 2005-2010, major ornithological surveys in the southern Mesopotamian wetlands were conducted by Canada-Iraq marshlands Initiative (CIMI), Iraqi Ministry of Environment (IMoEn.), Birdlife International, and Nature Iraq (Nature Iraq, 2017); among 34 sites, a total of 19 sites are situated within the geographical zone of the Mesopotamian marshlands of Endemic Bird Area (EPA). The presence of raptor species such as Egyptian Vulture *Neophron percnopterus* (Linnaeus, 1758), Greater Spotted Eagle, Eastern Imperial Eagle, and Saker Falcon *Falco cherrug* (Gray, 1834) was used as criteria to evaluate the nominated areas as IBAs. The Vulnerable Greater Spotted Eagle was recorded in five sites, the Vulnerable Eastern Imperial Eagle was recorded in eight sites, the Near Threatened Pallid Harrier was recorded in four sites, and the Near Threatened Cinereous Vulture was recorded at one site. The KBA assessment also indicated that the Central Marshes (IQ075) was hoisting all of the key raptor species of global conservation concern (Nature Iraq, 2017).

In October 2013-June 2014, a total of 13 raptors species were recorded in Central Marshes in southern Iraq by Fazaa *et al*. (2017); the recorded species were: one Black-winged Kite,

one White-tailed Eagle, two Cinereous Vulture, two Short-toed Snake-Eagle *Circaetus gallicus* (Gmelin, 1788), 28 Western Marsh Harrier, one Pallid Harrier, one Montagu's Harrier *Circus pygargus* (Linnaeus, 1758), two Eurasian Sparrowhawk, one Long-Legged Buzzard, two Greater Spotted Eagle, two Steppe Eagle, one Common Kestrel, and one Eurasian Hobby *F. subbuteo* (Linnaeus, 1758). Among the recorded species, four were listed by the International Union for Conservation of Nature (IUCN) Red List. Besides, he recorded White-tailed Eagle during December 2013 field surveys which considered as one of the significant findings as this species has not been recorded in the Central Marshes for more than 40 years (e.g. Moore and Boswell, 1956).

In Iraq, a total of 13 taxa of diurnal raptors (30.9%) were listed by the IUCN Red List (Birdlife International, 2018); the Egyptian Vulture, Steppe Eagle, Pallas's Fish Eagle *Haliaeetus leucoryphus* (Pallas, 1771), and two taxa of Saker Falcon *F. c. cherrug and F. c. milvipes* are listed as Endangered. The Greater Spotted Eagle, Eastern Imperial Eagle, and Red-capped Falcon *Falco* (*peregrinus*) *babylonicus* (P.L. Sclater, 1861) are listed as Vulnerable. The Bearded Vulture (Lammergeier) *Gypaetus barbatus* (Linnaeus, 1758), Cinereous Vulture, Pallid Harrier, Red Kite *Milvus milvus* (Linnaeus, 1758), and Red-footed Falcon *F. vespertinus* (Linnaeus, 1766) are listed as Near Threatened.

Among the flagship raptor species of the Mesopotamian marshes of southern Iraq is the Pallas's Fish Eagle, a scarce winter visitor to the wetlands of Mesopotamia, but it was not recorded since 1944 (Scott, 1995; Salim *et al.*, 2012). The status of the White-tailed Eagle in southern marshes is enigmatic. Moore and Boswell (1956) found it might be a regular winter visitor to Al Shuwaija Marsh and also observed it near Qurna and along the Shatt Al-Arab and Khamisiyah Marsh on 15th December 1945. It was recorded during the midwinter waterfowl survey in 1968 and in 1972, but none in the later surveys of 1975-1979 (Scott, 1995); however, despite very sporadic records, this species was recently recorded in Central Marshes during December 2013 (Fazaa *et al*., 2017). The Cinereous Vulture was wintering in the Mesopotamian marshes where three have been recorded in winter 1979 (Scott, 1995). There were no subsequent records of this species in the Mesopotamian marshes until two individuals were observed in Central Marshes in 2013-2014 (Fazaa *et al*., 2017). The Eastern Imperial Eagle is a fairly abundant as a common winter visitor to the Mesopotamian plains. A total of 76 individuals were recorded in mid-winter waterfowl censuses during 1968-1979 and it seemed likely that the total wintering population of this species in Mesopotamia at that time exceeded 100 individuals (Scott, 1995). The Greater Spotted Eagle was one of the main wintering and passage migrant raptors in the Mesopotamian marshes. A total of 24 individuals were observed during winter waterfowl survey in 1979 (Scott, 1995). A total of 12 Steppe Eagle were recorded during winter waterfowl survey in 1979 in the Mesopotamian marshes of southern Iraq (Scott and Carp, 1982; Scott, 1995) and it was recorded during the KBA surveys in 2005-2008 (Salim *et al*., 2009). Moreover, Fazaa *et al*. (2017) recorded two Steppe eagles in Central Marshes during 2013-2014. Regardless, the large Aquila eagles are still frequent to the suitable wintering habitats on the edge of the Mesopotamian marshes as the subsequent field surveys indicated.

Al-Sheikhly *et al*. (2017) mentioned that the lower Mesopotamian marshes and surrounding terrestrial ecoregions are essential wintering and stopover habitats for migratory *Aquila* eagles, especially those originated from breeding populations in Russia and Kazakhstan. Ring recoveries of Steppe and Eastern Imperial eagles that were ringed in Russia and Kazakhstan were obtained from the geographical zone of the Mesopotamian marshes in southern Iraq.

Up to our knowledge, the status of birds of prey breeding populations in Mesopotamian marshes is not fully known, the Western Marsh Harrier was abundant raptor species bred in the marshes near Basra and Hammar Lake where nests and chicks were found in 1920s (Ticehurst *et al*., 1922). The White-tailed Eagle nested in the reed-beds around the Mesopotamian marshes (Maxwell, 1957), and Thesiger (1964) also referred to eagles nesting in the reed-beds, but did not indicate which species were involved. The KBA assessment showed that the Black-winged Kite was recorded breeding in Ibn Najm marshland (Nature Iraq, 2017).

In recent decades, birds of prey populations are facing a catastrophic decline due to anthropogenic and climatic threat impacts such as widespread use of pesticides; habitats loss and destruction; climate change, consequent declines in prey abundance; direct persecution including shooting, trapping, and poisoning; and the wild-bird trade (Newton and Chandler, 1985; Meyburg and Chancellor, 1994; Bildstein, 2006; Al-Sheikhly *et al*., 2017). Given the lack of sufficient information on birds of prey communities in Mesopotamian marshes of southern Iraq. This research aimed to (i) Determine the migratory and breeding species of birds of prey and (ii) Highlight the potential threat impacts on the migratory population in the Mesopotamian marshes of southern Iraq.

MATERIALS AND METHODS

The Study Area

The Mesopotamian marshes are a vast complex of permanent freshwater wetlands, semi-desert aridlands, and scrublands encompass geographical zone (32°50' N 30°50'E) extending between Thi-Qar (Nassiriyah), Masyan (Emara), and Basra provinces in southern Iraq. The Mesopotamian marshes are consist of three major core areas which are the Central Marshes (*c*. 3000km^2), Eastern and Western Al-Hammar Marsh (*c*. 3000km^2), and Hawizeh Marsh (*c*. 2350km^2) with an estimated area of 9000-20000 km^2 (Al-Mansori, 2008; Hussain, 2014).

The Mesopotamian marshes occupy the Tigris-Euphrates Alluvial Salt Marsh (PA0906) Ecoregion with altitude less than 6m and supplied with water from the Tigris and Euphrates Rivers and their tributaries (Hussain, 2014; Nature Iraq, 2017). The major landscape is dominated by freshwater open lakes lined with dense Common Reed *Phragmites australis* beds and *Typha* sp. vegetation, arid plains with scattered xeric vegetations dominated mainly by *Tamarix* sp., open plains and cultivated fields edging the major wetlands, and mudflats that extend along the southern proportions of eastern Al-Hammar Marsh toward Al-Fao (Fao) Peninsula (Map.1).

Field Observations and Data Collection:

The occurrence of birds of prey in the Mesopotamian marshes was made through field observations, citing literature records, and personal communications of unpublished data obtained during 20 field expeditions conducted from January 2016 to April 2019. (i) Field observations: field records were obtained using rapid assessment through listing method (e.g. Sutherland, 2006). A total of 20 sites were visited during January 2016-April 2019. *In situ* work was of four-six hours per one-three days spent in the study sites and a period (4-6 hours/1-3 day/site) was spent. The starting time of the field surveys was varying. A list of observations (+/- presence/absence) with count was made from direct visual observations of live birds in the wild, birds in captivity, and/or dead specimens (hunted or trapped) within the study areas. Data documentation was made using Swarovski 10^{x}42 El Range Binocular and Canon digital camera bodies (EOS DSLR 80D and EOS DSLR 450D) fixed with Canon 100-400mm image stabilizer zoom lens. The species morphological description and field

identification remarks were following (Clark, 2000). (ii) Literature review: an intensive review of literature dated from 1918-2017 searching for available information on birds of prey in the Mesopotamian marshes was made. Publications such as journal articles, books, field guides, and academic theses including: Cumming(1918), Donald (1919), Ticehurst *et al*.(1922), Meinertzhagen (1914, 1924a, 1924b), Moor and Boswell (1956), Scott and Carp (1982), Scott (1993), Evans (1994), Scott (1995), Abed (2007), Salim *et al*. (2009), Al-Sheikhly *et al*. (2017) , Fazaa *et al*. (2017), and Nature Iraq (2017) which describe historical and recent records obtained for the geographical expanse of Mesopotamian marshes were reviewed. (iii) Personal communications of unpublished data: detailed Interviews with Marsh Arabs (indigenous inhabitants of Mesopotamian marshes), local hunters and trappers were periodically practiced and when possible. Interviews were recorded through note-taking and audio/photography documentation to supporting listing method (e.g. Sutherland, 2006). Threats on both species and habitats were recorded based on extensive literature review and field observations made during our current surveys; threats were categorized according to the IUCN classification (IUCN, 2017). The suggested status of raptors in the Mesopotamian marshes was assessed according to the number of available records of each species such as vagrant (one record only), rare (2-3 records), uncommon (4-5 records), widespread or common (6-9 records), and abundant (≥10 records).

RESULTS AND DISCUSSION

Systematic List of Species

The following species were recorded within the geographical zone of the Mesopotamian marshes and mentioned in the literatures and/or have been observed during April 2016-April 2019 field surveys. The species IUCN conservation status is mentioned as Least Concern (LC) Near Threatened (NT), Vulnerable (VU), and Endangered (EN) and their taxonomic order is following Blair *et al*. (2018).

1. Western Osprey *Pandion haliaetus* (Linnaeus, 1758) (LC)

Uncommon winter visitor and passage migrant in the Mesopotamian marshes; it was recorded by Ticehurst *et al*. (1922), Moor and Boswell (1956), and Scott and Carp (1982). An adult was shot over the aqua farms in Al-Masshab (Mashab) Marsh (30°35'58.83"N 47°41'46.17"E) in Eastern Al-Hammar Marsh in Basra province on January 2016. An adult has been recorded perching on an electricity pylon at the eastern edge of Hawizeh Marsh near Al-Kahla'a district (31°41'9.14"N 47°20'50.55"E) in Maysan province in March 2016.

2. Black-winged kite *Elanus caeruleus* (Desfontaines, 1789) (LC)

Uncommon and localized breeding resident in date palm orchids and cultivated fields on the edge of the Mesopotamian marshes; it was recorded by Salim *et al*. (2009), Nature Iraq (2017), and Fazaa *et al*. (2017). An adult has been recorded hovering over sparsely vegetated plains near Haur Al-Auda Marsh (31°37'49.58"N 46°51'13.43"E) in Masyan province on June 2017.

3. Egyptian Vulture *Neophron percnopterus* (Linnaeus, 1758) (EN)

Vagrant, probably a winter visitor and passage migrant to the arid lands, steppes, and dumpsites on the edge of the Mesopotamian marshes. Allouse (1960) mentioned that this species is frequent in plains of central and southern Iraq in winter without giving further details on exact localities. Recent satellite tracking showed that tagged Egyptian vultures are probably migrating through the northern edge of the Mesopotamian marshes (Buechley *et al*., 2018; Karyakin *et al*., 2018b).

4. European Honey Buzzard *Pernis apivorus* (Linnaeus, 1758) (LC)

Rare winter visitor and passage migrant to the cultivated fields, steppes, and dry plains on the edge of the Mesopotamian marshes; it was recorded in Al-Fao Peninsula in southern Iraq by Cumming (1918) and cited by Ticehurst *et al*. (1922). A juvenile has been recorded perching on the electricity pylons near Al-Eslah district (31°7'58.42"N 46°30'1.12"E) on the western part of the Central Marshes in Thi-Qar province on February 2017.

5. Eurasian Griffon Vulture *Gyps fulvus* (Hablitz, 1783) (LC) (Pl. 1a)

Vagrant, a winter visitor and passage migrant over arid lands on the edge of the Mesopotamian marshes. It was not listed among the raptors fauna of the Mesopotamian marshes; however, three Griffon vultures (two adults and one immature vulture) were observed on the arid plains to the west of Shatrah (31°23'31.82"N 45°50'37.87"E) at the northwestern part of the Central Marshes in Thi-Qar province on March 2018.

6. Cinereous (Black) Vulture *Aegypius monachus* (Linnaeus, 1766) (NT)

Rare winter visitor and passage migrant over dry steppes and aridllands on the edge of the Mesopotamian marshes. It was recorded from the geographical zone of southern marshes in mid-winter survey 1979 (Scott and Carp, 1982) and from Central Marshes (Fazaa *et al*., 2017; Nature Iraq, 2017).

7. Short-toed Snake Eagle *Circaetus gallicus* (Gmelin, 1788) (LC) (Pl. 1b)

Rare passage migrant and winter visitor to the vegetated plains, dry salty marshes (sabkhat), and shallow seasonal wetlands of the Mesopotamian marshes. It was recorded in the geographical zone of southern marshes in mid-winter survey in 1979 (Scott and Carp, 1982) and in Central Marshes (Fazaa *et al*., 2017). An adult female has been recorded hovering over Ishan Al-Gubbah Marsh (31° 4'2.28"N 47° 1'13.61"E) on the northern part of Central Marshes in Thi-Qar province on March 2018.

8. Lesser Spotted Eagle *Clanga pomarina* (Brehm, 1831) (LC)

Status uncertain, possibly a rare vagrant in the Mesopotamian marshes. It has been recorded from Basra (Donald, 1919) which cited by Ticehurst *et al*. (1922) and from southern Iraq (Meinertzhagen, 1924a), these were the only confirmed records of this species in southern Iraq.

9. Greater Spotted Eagle *Clanga* (*Aquila*) *clanga* (Pallas, 1811) (VU) (Pl. 1c)

Widespread winter visitor and passage migrant over the marshy lakes and vegetated plains of the Mesopotamian marshes. It was recorded almost by all previous surveys **(**Cumming, 1918; Donald, 1919; Ticehurst *et al*., 1922; Meinertzhagen, 1924b; Scott and Carp, 1982; Abed, 2007; Salim *et al*., 2009; Nature Iraq, 2017; Fazaa *et al*., 2017). A total of 18 individuals have been recorded in Central Marshes and 10 in Western Al-Hammar Marsh in Thi-Qar province during 2018-2019.

10. Booted Eagle *Hieraaetus pennatus* (Gmelin, 1788) (LC)

Rare winter visitor and passage migrant in the Mesopotamian marshes. It was recorded from Al-Fao Peninsula (Cumming, 1918) and cited by Ticehurst *et al*. (1922). An adult Booted Eagle has been recorded over Al-Shelajiyah mudflat (30°36'17.71"N 47°38'23.94"E) in the southern part of Eastern Al-Hammar Marsh in Basra province on April 2016.

11. Steppe Eagle *Aquila nipalensis* (Hodgson, 1833) (EN) (Pl. 1d)

Widespread winter visitor and passage migrant over the vegetated plains and dry steppes of the Mesopotamian marshes. It was recorded by Donald (1919), Ticehurst *et al*. (1922), Scott and Carp (1982), Abed (2007), Salim *et al*. (2009), and Fazaa *et al*. (2017). A ringed eagle was recovered from northeastern part of the southern marshes (Al-Sheikhly *et al*., 2017). It has been recorded from the dry plains of Al-Fao Peninsula and Eastern Al-Hammar Marsh in January 2016; two immature were recorded at Ishan Al-Azarag Marsh (31° 2'37.19"N 47° 9'34.29"E) in the northeastern part of the Central Marshes in Thi-Qar province on March 2018.

12. Eastern (Asian) Imperial Eagle *Aquila heliaca* (Savigny, 1809) (VU) (Pl.1e, f)

Widespread winter visitor and passage migrant over the vegetated plains and dry steppes of the Mesopotamian marshes. It was recorded by Donald (1919), Ticehurst *et al.* (1922), Scott and Carp (1982), Salim *et al.* (2009), and Nature Iraq (2017). A tagged eagle was recorded from northeastern part of the southern marshes (Al-Sheikhly *et al*., 2017). It is abundant along the highway between Ali-Al-Garbi and Hawr Sarrot Marsh (32° 9'23.73"N 46°57'35.92"E) in Masyan province where it observed on the electricity pylons in November 2017-January 2018. An immature was recorded over Ishan Al-Azarag Marsh in the northeastern part of the Central Marshes in Thi-Qar province on March 2018.

13. Golden Eagle *Aquila chrysaetos* (Linnaeus, 1758) (LC)

Status uncertain, possibly vagrant in the Mesopotamian marshes; it has been recorded from the restored marshes during 2004-2005 (Abed, 2007) and that seems the only record of this species within the geographical zone of the Mesopotamian marshes.

14. Eurasian Sparrowhawk *Accipiter nisus* (Linnaeus, 1758) (LC)

Widespread winter visitor and passage migrant in almost suitable habitats in the Mesopotamian marshes. It was recorded by Ticehurst *et al*. (1922), Scott and Carp (1982), Abed (2007), Salim *et al*. (2009), and Fazaa *et al*. (2017). It has been recorded over Hawizeh and Auda marshes in Maysan province in March 2016. Total of seven sparrowhawks were recorded over marshy lakes and date palm orchids on the edge of the Central Marshes in Thi-Qar province on January and March 2019.

15. Western Marsh Harrier *Circus aeruginosus* (Linnaeus, 1758) (LC) (Pl. 1g)

Widespread winter visitor and passage migrant in the Mesopotamian marshes; however, its current breeding status is uncertain. It has been recorded by Cumming (1918), Donald (1919), Ticehurst *et al*. (1922), Scott and Carp (1982), Abed (2007), Salim *et al*. (2009), and Fazaa *et al*. (2017). It has been recorded almost over the marshy wetlands in southern Iraq. A total of 13 individuals were recorded in Nagara Lake in Eastern Al-Hammar Marsh in Basra province in January 2017; three were recorded over dense reed beds in Hawizeh Marsh in Maysan province in March 2017. A large number of 93 Marsh harriers have been recorded over the Central Marshes in Thi-Qar province during February 2018-March 2019.

16. Hen Harrier *Circus cyaneus* (Linnaeus, 1766) (LC)

Uncommon winter visitor and passage migrant to the marshy lakes and vegetated steppes of the Mesopotamian marshes. It was recorded by Scott and Carp (1982), Abed (2007), and Salim *et al*. (2009). It seems that adult males are confused with adult males Pallid Harrier which is frequent to the wetlands of central and southern Iraq (e.g. Moor and Boswell, 1956). An adult male has been recorded from Abu Khasaf village (31°39'7.16"N 47°35'31.04"E) on the western edge of Al-Hawizeh Marsh in Maysan province in March 2017. Three Hen harriers were recorded over the Central Marshes in Thi-Qar province during 2018-2019.

17. Pallid Harrier *Circus macrourus* (S. G. Gmelin, 1770) (NT)

Widespread winter visitor and passage migrant to the marshy lakes and vegetated steppes of the Mesopotamian marshes. It was recorded by Cumming (1918), Ticehurst *et al*. (1922), Scott and Carp (1982), and Fazaa *et al*. (2017). An adult male was recorded over Al-Mansori River (30°41'16.05"N 47°38'59.51"E) in Eastern Al-Hammr Marsh in Basra province on February 2017. An adult male was observed flying over Abu Ajaj Marsh (30°53'59.42"N 46°56'13.58"E) in western Al-Hammar Marsh in Thi-Qar province in April 2018. Three Pallid harriers were recorded over Al-Baghdadiyah Lake (31°2'26.97"N 47° 4'19.14"E) in Central Marshes in Thi-Qar province in 2018.

18. Montagu's Harrier *Circus pygargus* (Linnaeus, 1758) (LC)

Rare winter visitor and passage migrant to the marshy lakes, cultivated fields, and dry steppes on the edge of the Mesopotamian marshes. It was recorded in the Central Marshes in 2013 (Fazaa *et al*., 2017). Two Montagu's harriers were recorded in the Central Marshes in Thi-Qar province in September and November 2018.

19. Black Kite *Milvus migrans* (Boddaert, 1783) (LC)

Rare winter visitor and passage migrant to dumpsites, dray steppes, and open plains one the edge of the Mesopotamian marshes. The European race *M. m. migrans* was recorded in the territory of southern marshes in winter 1979 (Scott and Carp, 1982). A flock of seven different ages Black kite was observed perching on electricity pylons and foraging over Al-Chebaeish city dumpsite (30°56'39.30"N 47° 0'26.52"E) in Thi-Qar province on April 2016.

20. Black-eared Kite *Milvus* (*migrans*) *lineatus* (J. E. Gray, 1831) (LC)

Status uncertain possibly overlooked as it is accompanying Black Kite *Milvus m. migrans* migratory flocks in the Mesopotamian marshes. A juvenile with distinctive morphological features (e. g. Clark, 2000) undoubtedly identified as Black-eared kite was observed in a mixed flock of Black kites foraging over the dumpsite of Al-Chebaeish city in Thi-Qar province on April 2016 (see Black Kite).

21. Pallas's Fish Eagle *Haliaeetus leucoryphus* (Pallas, 1771) (EN)

Status uncertain, possibly a rare winter visitor and passage migrant to the Mesopotamian marshes. It was only mentioned by Ticehurst *et al*. (1922) as one of the birds of prey of Mesopotamia and Scott (1995) indicated that Pallas's Fish Eagle was one of the avifauna of the southern wetlands in the winter of 1979; these were the only records of this species in the Mesopotamian marshes.

22. White-tailed Eagle *Haliaeetus albicilla* (Linnaeus, 1758) (LC)

Rare winter visitor and passage migrant over marshy wetlands, vegetated steppes, and arid lands on the edge of the Mesopotamian marshes; it was recorded within the territory of the southern marshes (Moor and Boswell, 1956; Scott and Carp, 1982) and recently recorded in the Central Marshes in Thi-Qar province on 2013 (Fazaa *et al*., 2017).

23. Long-legged Buzzard *Buteo rufinus* (Cretzschmar, 1829) (LC) (Pl. 1h)

A widespread winter visitor and passage migrant over the vegetated steppes, cultivated fields, and open grasslands on the edge of the Mesopotamian marshes. It was recorded by Cumming (1918), Ticehurst *et al*. (1922), Scott and Carp (1982), Salim *et al*. (2009), and Fazaa *et al*. (2017). Two buzzards of this species were observed perching on the electricity pylons along the road linking Al-Adel Township to Al-Auda Marsh (31°29'33.96"N 47° 2'47.53"E) on March 2016. A juvenile was recorded over the Central Marshes in Thi-Qar province on March 2018.

24. Northern Steppe Buzzard *Buteo buteo vulpinus* (Gloger, 1833) (LC)

Rare winter visitor and passage migrant over the vegetated steppes, cultivated fields, and open grasslands on the edge of the Mesopotamian marshes. It was recorded from Al-Fao Peninsula in southern Iraq by Cumming (1918) and cited by Ticehurst *et al*. (1922). A flock of five buzzards of the northern race *B. b. vulpinus* were recorded over Ishan Halab Marsh (31°3'45.78"N 47° 6'33.60"E) at the northern edge of the Central Marshes in Thi-Qar province on March 2018.

25. Lesser Kestrel *Falco naumanni* (Fleischer, 1818) (LC)

Vagrant, a winter visitor and passage migrant to the Mesopotamian marshes; it was reported in the territory of southern wetlands by Ticehurst *et al*. (1922) which is the only record we had.

26. Common Kestrel *Falco tinnunculus* (Linnaeus, 1758) (LC)

Widespread winter visitor and passage migrant over the marshy lakes, urban areas, and cultivated fields on the edge of the Mesopotamian marshes; however, the breeding status is uncertain, probably a local breeding resident. It was recorded by Cumming (1918), Donald (1919), Ticehurst *et al*. (1922), Scott and Carp (1982), Abed (2007), Salim *et al*. (2009), and Fazaa *et al*. (2017). There were four records of this species; an adult male was observed over Abu Sobat canal (30°58'16.00"N47°1'28.45"E) in Al-Chebaeish district in Thi-Qar province in January 2016, an adult male was soaring over the plains of Al-Hilfayah (31°39'27.55"N 47°30'6.56"E) on the western edge of Hawizeh Marsh in Masyan province on March 2017; an adult female was observed hovering over the fields of Abu Sakheer (30°41'55.98"N 47°26'3.45"E) in Eastern Al-Hammar Marsh in Basra province on March 2018, and four individuals were recorded in Central Marshes in Thi-Qar province on 2018-2019.

27. Merlin *Falco columbarius* (Linnaeus, 1758) (LC)

Rare winter visitor and passage migrant to the marshy lakes, open plains, and cultivated fields on the edge of the Mesopotamian marshes; it was recorded in the southern marshes by Ticehurst *et al*. (1922) and Scott and Carp (1982). An adult with pale plumage possibly of the Central Asian race *F.c. pallidus* was recorded flying over Ishan Halab Marsh in Central Marshes in Thi-Qar province on March 2018.

28. Eurasian Hobby *Falco subbuteo* (Linnaeus, 1758) (LC)

Rare winter visitor and passage migrant to the marshy lakes, open plains, and cultivated fields on the edge of the Mesopotamian marshes. It was recorded by Cumming (1918) in Al-Fao Peninsula and cited by Ticehurst *et al*. (1922), and form Central Marshes in 2013 (Fazaa *et al*., 2017).

29. Lanner Falcon *Falco biarmicus* (Temminck, 1825) (LC)

Vagrant, a winter visitor and passage migrant; it was recorded from Al-Fao Peninsula by Cumming (1918) and cited by Ticehurst *et al*. (1922) which is the only record we had.

30. Southern Saker Falcon *Falco cherrug milvipes* (Jerdon, 1871) (EN)

Vagrant, a winter visitor and passage migrant, it was recorded for the territory of southern wetlands by Ticehurst *et al*. (1922) which is the only record that has been obtained.

31. Peregrine Falcon *Falco peregrines* (Tunstall, 1771) (LC)

Uncommon winter visitor and passage migrant to the marshy lakes and open shallow seasonal wetlands of Mesopotamian marshes where large flocks of water birds are congregating; it has been recorded in southern marshes by Cumming (1918), Donald (1919), Ticehurst *et al*. (1922), and Scott and Carp (1982). A large adult female was trapped near Al-Edheam mudflats (31°43'31.86"N 47°45'12.83"E) at the northern edge of Hawizeh Marsh in Maysan province in December 2017.

32. Barbary Falcon *Falco* (*Peregrinus*) *pelegrinoides* (Temminck, 1829) (LC)

Vagrant, a winter visitor and passage migrant to marshy lakes, open vegetated plains on the edge of the Mesopotamian marshes. An adult male with remarkably large rufous hind neck, faintly barred under parts, and brown-grayish plumage was observed over the 5th irrigation canal (30°56'50.11"N 47° 8'40.06"E) in Western Al-Hammar Marsh in Thi-Qar province on April 2018.

When adding the data obtained from 2016-2019 field surveys with previous related literature records, it is found that 32 species from total 42 species/taxa listed in Iraq (e.g. Blair *et al*., 20018) (76.1%) have been recorded in the zoogeographical range of the Mesopotamian marshes from 1918 to April 2019. During 2003-2017, several ornithological studies were conducted in the Mesopotamian marshes (e.g. Abed, 2007; Salim *et al*., 2009; Nature Iraq, 2017; Fazaa *et al.*, 2017). Total of six raptors species (two IUCN Red-listed) were recorded in the restored marshes during the period from May 2004- to May 2005 (Abed, 2007). Only six raptor species were recorded during the field surveys conducted in the Mesopotamian marshes from April 2005-to December 2008 (Salim *et al*., 2009). Despite there were several raptor species that have been recorded through regular observations in the Mesopotamian marshes from April 2005 to late 2010, only four raptor species were used as KBA key species criteria (Nature Iraq, 2017). Three globally threatened species (Greater Spotted Eagle, Eastern Imperial Eagle, and Pallid Harrier) were used as vulnerability criteria to assess the KBA sites in Mesopotamian marshes and also have been recorded in our recent study (Tab. 1). Moreover, the current field surveys conducted in the Central Marshes from October 2013-June 2014 detected a total of 13 raptor species from which four are IUCN Red-listed (Fazza *et al.*, 2017).

The results show that Mesopotamian marshes seem ecologically and climatically important as a stopover site for globally threatened migratory raptors. In Iraq, a total of 13 raptor species of global conservation concern have been recorded (Salim *et al.*, 2012) from which seven species (53.8%) have been recorded by literature in the geographical zone of the Mesopotamian marshes. In current study, a total of eight globally threatened species (four Endangered, two Vulnerable, and two Near-threatened) were recorded (Tab.1).

Table (1): List of diurnal raptors recorded in the geographical zone of Mesopotamian marshes from 1918-2019 with their current taxonomic revision (Blair *et al.*, 2018) and International Union for Conservation of Nature (IUCN) Conservation Status. LC: Least Concern; NT: Near Threatened; VU: Vulnerable; EN: Endangered; WV: Winter Visitor; PM: Passage Migrant; RV: Rare Vagrant; BSV: Breeding Summer Visitor; BR: Breeding Resident.* Not the actual number of species detected, it is based on KBA vulnerability criteria and/or published records (Nature Iraq, 2017).

No.	Common Name	Scientific Name	IUCN Status	Cumming (1918)	Donald (1919)	Ticehurst *et al.* (1922)	Meinertzhagen (1914, 1924 a & b)	Moor and Boswell (1956)	Scott and Carp (1982)	Abed (2007)	Salim *et al.* (2009)	Nature Iraq (2017)	Fazaa *et al.* (2017)	January 2016- April 2019 Current Study	Status in Iraq
1	Western Osprey	*Pandion haliaetus*	LC	-	-	+	-	+	+	-	-	-	-	+	WV; PM
2	Black-winged kite	*Elanus caeruleus*	LC	-	-	-	-	-	-	-	+	+	+	+	Localized BR; WV; PM
3	Egyptian Vulture	*Neophron percnopterus*	EN	-	-	-	-	-	-	-	-	-	-	+	WV; PM; BSV; BR in northern, northwestern, and northwestern Iraq. Satellite tracking showed that Egyptian Vulture is probably passing through Mesopotamian marshes in southern Iraq (Buechley *et al.* 2018; Karyakin *et al.* 2018b)
4	European Honey Buzzard	*Pernis apivorus*	LC	+	-	+	-	-	-	-	-	-	-	+	PM and possibly a regular WV
5	Eurasian Griffon Vulture	*Gyps fulvus*	LC	-	-	-	-	-	-	-	-	-	-	+	BR; BSV in northern Iraq and possibly in northwestern Iraq; WV; PM.
6	Cinereous Vulture	*Aegypius monachus*	NT	-	-	-	-	-	+	-	-	+	+	-	WV; PM; possibly breed in northern Iraq.
7	Short-toed Snake Eagle	*Circaetus gallicus*	LC	-	-	-	-	+	-	-	-	-	+	+	BSV; WV; PM
8	Lesser Spotted Eagle	*Clanga pomarina*	LC	-	+	-	+	-	-	-	-	-	-	-	RV; possibly a regular WV in northern Iraq
9	Greater Spotted Eagle	*Clanga clanga*	VU	+	+	+	+	-	+	+	+	+	+	+	WV; PM
10	Booted Eagle	*Hieraaetus pennatus*	LC	+	-	+	-	-	-	-	-	-	-	+	BSV in northern Iraq; PM; WV
11	Steppe Eagle	*Aquila nipalensis*	EN	-	+	+	-	-	+	+	+	-	+	+	WV; PM
12	Eastern Imperial Eagle	*Aquila heliaca*	VU	-	+	+	-	-	+	-	+	+	-	+	WV; PM
13	Golden Eagle	*Aquila chrysaetos*	LC	-	-	-	-	-	-	+	-	-	-	-	BR in northern Iraq; WV; PM
14	Eurasian Sparrowhawk	*Accipiter nisus*	LC	-	-	+	-	-	+	+	+	-	+	+	BR in northern and northwestern Iraq; WV; PM

15	Western Marsh Harrier	*Circus aeruginosus*	LC	+	+	+	-	-	+	+	+	-	+	+	BR in southern Iraq; WV; PM
16	Hen Harrier	*Circus cyaneus*	LC	-	-	-	-	-	+	+	+	-	-	+	WV; PM
17	Pallid Harrier	*Circus macrourus*	NT	+	-	+	-	-	+	-	-	+	+	+	WV; PM
18	Montagu's Harrier	*Circus pygargus*	LC	-	-	-	-	-	-	-	-	-	+	+	WV; PM; possibly breed in northern Iraq
19	Black Kite	*Milvus migrans*	LC	-	-	-	-	-	+	-	-	-	-	+	WV; PM; possibly breed in northern Iraq
20	Black-eared Kite	*Milvus (migrans) lineatus*	LC	-	-	-	-	-	-	-	-	-	-	+	WV; PM
21	Pallas's Fish Eagle	*Haliaeetus leucoryphus*	EN	-	-	+	-	-	-	-	-	-	-	-	RV
22	White - tailed Eagle	*Haliaeetus albicilla*	LC	-	-	-	-	+	+	-	-	-	+	-	WV; PM
23	Long-legged Buzzard	*Buteo rufinus*	LC	+	-	+	-	-	+	-	+	-	+	+	BR in northern Iraq; WV; PM
24	Northern Steppe Buzzard	*Buteo buteo vulpinus*	LC	+	-	+	-	-	-	-	-	-	-	+	BR in northern Iraq; WV; PM
25	Lesser Kestrel	*Falco naumanni*	LC	-	-	+	-	-	-	-	-	-	-	-	BSV in northern and northeastern Iraq; WV; PM
26	Common Kestrel	*Falco tinnunculus*	LC	+	+	+	-	-	+	-	+	-	+	+	BR; WV; PM
27	Merlin	*Falco columbarius*	LC	-	-	+	-	-	+	-	-	-	-	+	WV; PM
28	Eurasian Hobby	*Falco subbuteo*	LC	+	-	+	-	-	-	-	-	-	+	-	WV; PM; possibly breed in northern Iraq
29	Lanner Falcon	*Falco biarmicus*	LC	+	-	+	-	-	-	-	-	-	-	-	WV; PM
30	Southern Saker Falcon	*Falco cherrug ('milvipes-type')*	EN	-	-	+	-	-	-	-	-	-	-	-	status unknown; WV; PM
31	Peregrine Falcon	*Falco peregrinus*	LC	+	+	+	-	-	+	-	-	-	-	+	WV; PM; doubtful breeding in northern Iraq
32	Barbary Falcon	*Falco (peregrinus) pelegrinoides*	LC	-	-	-	-	-	-	-	-	-	-	+	BR in northern and northeastern Iraq ;WV; PM
Total recorded species				11	7	19	2	3	15	6	9	5*	13	23	

Allouse (1960) mentioned that the Egyptian Vulture is widespread in open dry plains and steppes in central and southern Iraq in winter without providing further details on wintering localities. Recent satellite tracking showed that tagged Egyptian vultures are probably distributed throughout the geographical zone of the Mesopotamian marshes during their migration (Buechley *et al*., 2018; Karyakin *et al*., 2018b). We regarded this species as vagrant to the Mesopotamian marshes, but it might be a regular winter visitor and passage migrant; therefore, further field observations are required to verify such claim.

The occurrence of the Golden Eagle in Mesopotamian marshes is possibly being overlooked but it is worth mentioning. It has been recorded in the restored marsh in May 2004-May 2005 (Abed, 2007) who indicated that species identification was based on visual observation. This species is probably misidentified as a Greater Spotted Eagle which is a widespread passage migrant and winter visitor in the southern Iraqi wetlands. Moreover, Golden Eagle is scarce elsewhere in Arabia, it has localized breeding populations confined to the Zagros Mountains in western Iran, southern Saudi Arabia, United Arab Emiratis, Oman, and recorded as a vagrant in Kuwait (Porter and Aspinall, 2010). Furthermore, the Golden Eagle has never been recorded during the previous or current surveys in southern marshes; thus, its enigmatic status in the Mesopotamian marshes requires further investigation.

The occurrence of the Tawny Eagle *Aquila rapax* (Temminck, 1828) in Iraq is uncertain; specimens obtained from Kut and Basra with wing span 520 and 525mm was assigned to this species by Mr. W. L. Bclater; However, Ticehurst *et al*. (1922) indicated that were no records which can safely be assigned to this species in Mesopotamia. Despite what mentioned above, Tawny Eagle was noted near Ramadi in western Iraq in November (Ticehurst *et al*., 1926; Allouse 1953; Moore and Boswell, 1956). It is worth mentioning, that this species was omitted by Salim *et al.* (2012) without sufficient justification. Breeding populations of Tawny Eagle are found in southwestern Saudi Arabia, northwestern Yemen, southern Iran, and has been recorded in Oman (may refer to Indian race *A. r. vindhiana*), and Palestine as a vagrant (Porter and Aspinall, 2010).

The status of the Lesser Spotted Eagle in the Mesopotamian marshes is also uncertain; it was recorded from Basra (Donald, 1919) and vicinity of Tekrit and marshes of Kurna in winter (Meinertzhagen, 1914; Allouse, 1953). However, Salim *et al*. (2012) mentioned that those records were no longer considered acceptable as they almost certainly referred to Greater Spotted Eagle. The omitting of Lesser Spotted Eagle from Iraq avifauna was not sufficiently justified by Salim *et al.* (2012) as he did not provide a robust refutation to previous records (Meinertzhagen, 1914; Donald, 1919) and/or a detailed taxonomic explanation of why being referred as Greater spotted eagles. However, the first photographic documentation of this species was obtained in Penjween in northern Iraq (Kurdistan) (Ararat, 2016).

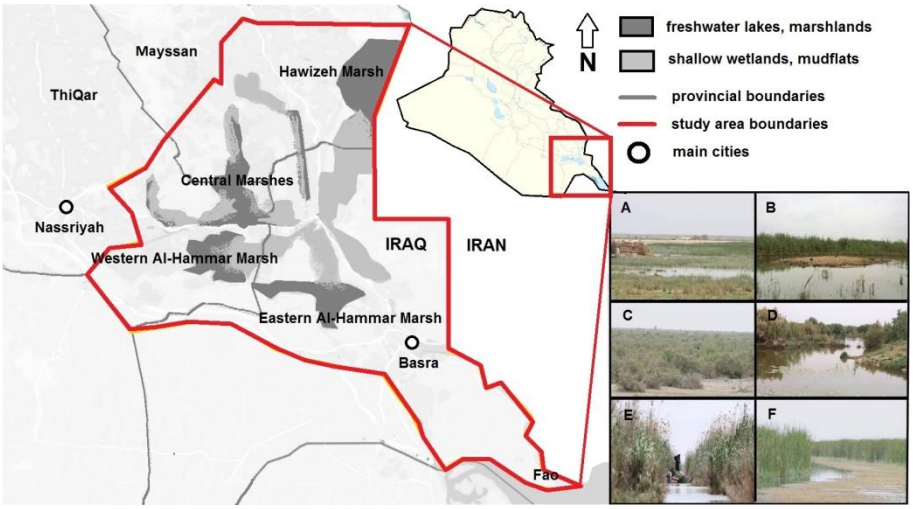
Moor and Boswell (1956) mentioned that Lesser Peregrine Falcon which wintering in Mesopotamian wetlands are probably from the races *F. p. brookei* and *F. p. pelegrinoides*. The Barbary Falcon *F. pelegrinoides* is considered to be a subspecies of the Peregrine Falcon which is a resident breeder and widely distributed in the deserts and arid steppes of Mesopotamia during winter (White *et al.*, 2013). There was no attempt to distinguish between the very similar races of Barbary Falcon *F. p. pelegrinoides* and Red Capped Falcon "Red-nape Shaheen" *F. p. babylonicus* which both are likely to breed in Iraq but their distribution range and ecological separation required comprehensive study (Salim *et al.*, 2012). Ararat *et al*. (2011) confirmed the breeding of *F. p. pelegrinoides* in northern Iraq and reported that

Peregrine Falcon of the race *F. p. brookei* is also breeding at only one site in northwestern Iraq. Subsequently, this Peregrine breeding record was reviewed and revised by Al-Sheikhly (2012) and assigned to *F. p. pelegrinoides* race of Barbary Falcon (Al-Sheikhly, 2014).

The biodiversity in the Iraqi marshes is influenced by the hydrological fluctuation between the flood and drainage seasons (Richardson *et al*., 2005). In addition, the anthropogenic environmental stress affects the biological productivity of the wetland communities and reduces the optimal nutritional activities, richness and abundance of the native biota (Rader *et al*., 2001). During the current field surveys, several threats that affecting both raptors and their habitats were observed. The drought and extreme temperature (observed in May-June 2018) have probably led to reduce water levels and vegetation cover over large extents in the Mesopotamian marshes which subsequently impacted on the abundance of native biota (e.g. Fazaa *et al*., 2017). Moreover, it seems that the extreme hot weather reduces the prey abundance which is subsequently affecting the presence of breeding raptors species. The Common Kestrel was the only species recorded in the Mesopotamian marshes during summer surveys in May-June 2018 where it is possibly breed; yet, its breeding was not confirmed. Pollution especially with domestic and urban waste water and garbage/solid wastes was evaluated as a very high threat in the Mesopotamian marshes which warrants immediate remedy by local communities.

Hunting and trapping was suggested to pose threats on migratory raptors along their migration routes and in wintering areas (Karyakin, 2015; Karyakin *et al*., 2018a). The field observations showed that over-exploitation and direct persecution (illegal trade, trapping and shooting) is one of the major threats affecting birds of prey population especially those wintering in southern wetlands. Several migratory raptors species especially large *Aquila* eagles are persecuted whenever and wherever possible by local hunters without known motivations (Pl. 2).

The Iraqi legislation of Protection of Wild Animals Law (no. 17 issued on 15 February 2010) bans the illegal hunting practices of many avian species. Only five raptor species (White-tailed Eagle, Eurasian Griffon Vulture, Golden Eagle, Lanner Falcon, and Saker Falcon) in which all have been recorded in the Mesopotamian marshes are prohibited to be hunted by this law. However, the absence of full enforcement of existing legislations might cause national and possibly regional declines of certain raptor species in Iraq and the Middle East (Al-Sheikhly, 2011, 2012, 2014). Indeed, the conservation of birds of prey and other indigenous biota is an environmental responsibility that required to be achieved by Iraqi related authorities.



Map (1): The Mesopotamian marshes in Southern Iraq, showing the boundaries of the study area along with different habitats (aquatic and terrestrial); (A) Shallow marshes edged with scrubland and terrestrial embankments, (B) Muddy islets lined with dense Common Reed *Phragmites australis* vegetation in the main water body of the Central Marshes, (C) The open vegetated plains of the north-western edge of the Central Mashes, (D) A mixed landscape of dense *Tamarix* sp. vegetation interacted with shallow watercourses; (E and F) Typical water ways of the Mesopotamian marshes freshwater lakes. (All photos were photographed by Omar F. Al-Sheikhly).

Plate (1): Some birds of prey in the Mesopotamian marshes; (A) Eurasian Griffon Vulture, (B) Adult female Short-toed Snake Eagle, (C) Adult Greater Spotted Eagle, (D) Immature Steppe Eagle**, (**E) Adult Eastern Imperial Eagle, (F) Juvenile Eastern Imperial Eagle, (G) Adult male Western Marsh Harrier, (H) Adult Long-legged Buzzard. (All photos were photographed by Omar F. Al-Sheikhly).

Plate (2): The illegal hunting of birds of prey; a juvenile Eastern Imperial Eagle persecuted by local hunter on the edge of the Mesopotamian marshes. (A photo was photographed by Omar F. Al-Sheikhly).

CONCLUSIONS

In this study, the ecological importance of the Mesopotamian marshes for migratory and breeding populations of birds of prey has been highlighted. The Mesopotamian marshes are falling within the major flyways of migratory birds of prey that migrating form breeding grounds in northern hemisphere toward wintering grounds in Arabia and Africa. Therefore, the ecosystems of the Mesopotamian marshes are probably sustaining large numbers of migratory birds of prey annually which required to be conserved accordingly. Besides personal communication and literature review, the field observations indicated that total of 32 species of bird of prey occur within the geographical zone of the Mesopotamian marshes. Out of these 32 species, eight globally threatened species (four Endangered, two Vulnerable, and two Near-threatened) were recorded in the current study. With particular emphasis on large migratory *Aquila* eagles, the Mesopotamian marshes are hosting migratory population of the globally threatened Greater Spotted, Eastern Imperial, and Steppe eagles. In addition, three species of Old-world vultures have been recorded during recent surveys which highlight the ecological importance of the area as an important stopover sites for migratory vultures. Previously, the marshes hosted breeding populations of White-tailed Eagle and Western Marsh Harrier, but because of unstable fluctuation of the ecological conditions and increasing anthropogenic and climatic risks in the marshes, these breeding populations were possibly faded. Despite the unique communities of birds of prey in the Mesopotamian marshes; yet, threats such as species persecution, pollution, habitat destruction and fragmentation, and climate change are posing concerns on their survival.

ACKNOWLEDGMENT

We are grateful to Mukhtar K. Haba and Nadheer A. Fazaa (College of Science for Women-University of Baghdad, Iraqi Green Climate Organization IGCO) for their dedicated participations in the field surveys (data collecting and analyzing; species/sites identification) along with their editorial comments on the draft of this manuscript; to Ra'ad H. Al-Asady and Habeeb T. Al-Asady (Al-Chebaeish Ecotourism Organization) for their devoted participation in the field work (providing field logistics; assisting in sites identification). We also thank Philippe de Grissac and Claire Paque (Ligue for Protection of Birds LPO-BirdLife-France) and other members of French delegation for their support and participation in the field observations made in Central Marshes during March 2018.

LITERATURE CITED

Abed, J. M. 2007. Status of water birds in restored Southern Iraqi marshes. *Marsh Bulletin*, 2(1): 64-79.

Allouse, B. 1953. The avifauna of Iraq. Iraq Natural History Museum, Baghdad, 163pp.

Allouse, B. 1960. Birds of Iraq. 2nd ed. Al-Rabita Press, Baghdad, Iraq, 276pp. [In Arabic].

Al-Mansori F.Y. 2008. The future expectations for the marshlands restoration. Ph.D. thesis, College of Science, Basra University, 174pp.

Al-Sheikhly O. F. 2014. Peregrine falcons wintering in Baghdad, Iraq. *Falco*, 42: 6-7.

Al-Sheikhly, O. F. 2011. A survey report on the raptors trapping and trade in Iraq. *Wildlife Middle East*, 6 (1): 1- 45.

Al-Sheikhly, O. F. 2012. Report on the first record of Red-footed Falcon *Falco vespertinus* in Iraq. *Falco*, 39: 10-11.

Al-Sheikhly, O. F., Al-Barazangi, A. N., Mukhtar, K.H., Fazaa, N., Abdulzahra, H. K., Abou Turab, M. K. and Al-Azawi A. J. 2017. Ring recoveries from Steppe eagles and Eastern Imperial eagles from the Russian and Kazakhstan breeding populations and a review of major threats to eagles in Iraq. *Raptors Conservation*, 35: 51-61.

Ararat, K. 2016. First record of Lesser Spotted Eagle *Clanga pomarina*, first breeding record of Eurasian Penduline Tit *Remiz pendulinus* and first records of Eastern Bonelli's Warbler *Phylloscopus orientalis*, Olive Tree Warbler *Hippolais olivetorum* and Goldcrest *Regulus regulus*, for Iraq. *Sandgrouse*, 38(1): 106-109.

Ararat, K., Fadhil O., Porter, R. F. and Salim, M. 2011. Breeding birds in Iraq: important new discoveries. *Sandgouse*, 33 (1): 12-33.

Bildstein, K. L. 2006. Migrating raptors of the world: their ecology and conservation. Cornell University Press, Ithaca, USA, 320pp.

Birdlife International. 2018. Data zone: Iraq. Available at: http://datazone.birdlife.org/country/iraq

Blair, M., Perlman, Y. and Sheldon, R. 2018. Pocket checklist of the birds of OSME region. Ornithological Society of Middle East, the Caucasus and central Asia, UK, 64pp.

Boere, G. C. and Stroud, D. A. 2006. The flyway concept: what it is and what it isn't, p 40–47. *In*: Boere, G. C., Galbraith, C. A. and Stroud, D. A. (eds.). Waterbirds around the world. Edinburgh, UK: The Stationery Office.

Buechley, E. R., McGrady, M. J., Çoban, E. and Şekercioğlu, Ç. H. 2018. Satellite tracking a wide ranging endangered vulture species to target conservation actions in the Middle East and East Africa. *Biodiversity* and *Conservation*, 27 (9): 2293–2310.. DOI: 10.1007/s10531-018-1538-6

Clark, W. S. 2000. A Field guide to the raptors of Europe, the Middle East, and North Africa, illustrated edition.USA: Oxford University Press, USA, 371pp.

Cumming, W. D. 1918. Natural history notes from Fao. *Journal of the Bombay Natural History Society*, 26: 292–295.

Donald, C. H. 1919. Some birds of prey of Mesopotamia. *Journal of the Bombay Natural History Society*, 26: 845-846.

Evans, M. I. 1994. Important Bird Areas in the Middle East. Cambridge, UK: BirdLife International, 410 pp.

Fazaa, N. A., Dunn, J. C. and Whittingham, M. J. 2017. Distributions and community composition of birds in Iraq's Central Marsh. *International Journal of Biodiversity*, 2017(4198690):1-28.

Hahn, S., Bauer, S. and Liechti, F. 2009. The natural link between Europe and Africa -2.1 billion birds on migration. *Oikos*, 118: 624–626.

Hussain, N. A. 2014. Biotopes of the Iraqi marshes. First Edition. Dhifaf publishing house, Basra, Iraq, 432pp.

IMOE. 2018. Sixth National Report of Iraq to the Convention of Biological Diversity. Iraqi Ministry of Environment, Baghdad, Iraq, 292pp.

IUCN-International Union for Conservation of Nature. 2017. The Guidelines for Using the IUCN Red List Categories and Criteria version. Available at: https://www.iucnredlist.org/resources/redlistguidelines

Karyakin, I. 2105. The steppe eagle global conservation status was raised. *Raptors Conservation*, 30: 21-30.

Karyakin, I., Bekmansurov, R. and Babushkinv, M. 2018a. Study of territorial connections in eagles by color ringing method within the program of the Russian raptor research and conservation. *Raptors Conservation*, 37: 15-48.

Karyakin, I. V., Bekmansurov, R. H., Nikolenko, E. G. and Dzhamirzoev, G. S. 2018b. Monitoring results from the breeding group of Egyptian Vulture at Narat-Tyube ridge and GPS/GSM tracking data from Juvenile Egyptian Vultures (Republic of

Dagestan, Russia). *Raptors Conservation*, 36: 108–135. DOI: 10.19074/1814-8654-2018-36-108-135

Maxwell, G. 1957. A reed shaken by the wind; a journey through the unexplored marshlands of Iraq. Penguin, Harmondsworth, 223pp.

Meinertzhagen, R. 1914. Notes from Mesopotamia. *Ibis*, 2(10): 387-395.

Meinertzhagen, R. 1924a. An account of a journey across the Syrian Desert from Amman to Ramadi. *Ibis*, 6(11): 87-101.

Meinertzhagen, R. 1924b. Notes on a small collection of birds made in Iraq in the winter of 1922-23. *Ibis*, 6(11): 601-625.

Meyburg, B. U. and. Chancellor, R. D. (eds). 1994. Raptor conservation today. World Working Group on Birds of Prey and Owls, Berlin, Germany, 799pp.

Moore, H. J. and Boswell, C. 1956. Field observations on the birds of Iraq. *Iraq Natural History Museum*, Baghdad, 109pp.

Nature Iraq. 2017. Key Biodiversity Areas of Iraq. Al-Ghadeer Printing, Basra, Iraq, 297pp.

Newton, I. and Chandler, R. D. 1985. Conservation studies on raptors. ICBP Technical Publication No. 5. International Council for Bird protection, Cambridge, England, 482pp.

Porter, R. F. and Aspinall, S. 2010. Birds of the Middle East. Christopher Helm, London, 384pp.

Rader, R. B., Batzer, D. P. and Wissinger, S. A. (eds). 2001. Bioassessment and Management of North American Freshwater Wetlands. John Wiley and Sons, New York, NY, USA, 489pp.

Richardson, C. J., Reiss, P., Hussain, N. A., Alwash, A. J. and Pool, D. J. 2005. The restoration potential of the Mesopotamian marshes of Iraq. *Science*, 307: 1307-1311.

Salim, M. A., Al-Sheikhly, O. F., Majeed, K. A. and Porter, R. F. 2012. Annotated checklist of the birds of Iraq. *Sandgrouse*, 34(1): 3-44.

Salim, M., Porter, R. and Rubec, C. 2009. A summary of birds recorded in the marshes of southern Iraq, 2005–2008. *BioRisk*, 3: 205–219.

Scott D. A. 1995. A directory of Wetland in the Middle East. IWRP; Slimbridge, UK, 301pp.

Scott, D. A. 1993. Wetlands of West Asia - A regional overview. *In*: Moser, M. and van Vessem, J. (eds), Wetland and Waterfowl Conservation in South and West Asia: 9-22. Proc. International Symposium, Karachi, Pakistan 14-20 December 1991. IWRB Special Publication No. 25. AWB Publication No. 85. IWRB, Slimbridge, U.K. and AWB, Kuala Lumpur, Malaysia. No. 3, p 67-77.

Scott, D. A. and Carp, E. 1982. A midwinter survey of wetlands in Mesopotamia, Iraq: 1979. *Sandgrouse*, 4: 6-76.

Sutherland W. J. 2006. Ecological census techniques: a Handbook. Cambridge University Press, UK, 432 pp.

Thesiger, W. 1964. The Marsh Arabs. Longmans, Green & Co. Pub., London, 326pp.

Ticehurst, C. B, Buxton, P. A. and Cheesman, R. E. 1922. The birds of Mesopotamia. *Journal of the Bombay Natural History Society*, 28: 381-427.

Ticehurst, C. B., Cox, P. Z. and Cheesman, R. E. 1926. Additional notes on the avifauna of Mesopotamia. *Journal of the Bombay Natural History Society*, 31: 91-119.

White, C. M., Sonsthagen, S. A., Sage, G. K., Anderson, C. and Talbot, S. L. 2013. Genetic relationships among some subspecies of the peregrine falcon *Falco peregrines* (L.), inferred from mitochondrial DNA control-region sequences. *The Auk*, 130: 78-87.

The diurnal birds of prey (Raptors) in the Mesopotamian marshes

Bull. Iraq nat. Hist. Mus.
(2019) 15 (4): 381-402

الطيور الجارحة (الجوارح) النهارية في أهوار بلاد الرافدين في جنوب العراق مع ملاحظات عن حالة الصون

عمر فاضل الشيخلي * أحمد جاسم العزاوي
قسم علوم الحياة، كلية العلوم، جامعة بغداد، بغداد، العراق

تأريخ الاستلام: ٢٠١٩/٧/١٥ ، تأريخ القبول: ٢٠١٩/٩/١١ ، تأريخ النشر: ٢٠١٩/١٢/٢٦

الخلاصة

أن الطيور الجارحة (الجوارح) هي مجموعة متميزة من الطيور المفترسة التي تهاجر سنويا عبر أهوار بلاد الرافدين في جنوب العراق نحو أراضي التشتية في شبه الجزيرة العربية وأفريقيا، بينما البعض الأخر مقيم ومَفرَخ، ولكن توجد شحة من المعلومات حول وضعها الحالي. تم أجراء عشرين بعثة حقلية خلال كانون الثاني ٢٠١٦ ولغاية نيسان ٢٠١٩ ضمن النطاق الجغرافي لأهوار بلاد الرافدين وهي أراضي رطبة دولية. غطت المسوحات الحقلية الأهوار الوسطى، هور الحمار، وهور الحويزة.

أن أحد اهداف المسوحات الحقلية هو وضع قائمة بأنواع الجوارح المهاجرة (المشتية أو القاطعة) في أهوار بلاد الرافدين ومعرفة أنتشارها الزماني والمكاني الحالي. في هذه الدراسة تم تسجيل ٣٢ نوعاً من الجوارح النهارية من خلال مسوحات حقلية مستفيظة، مراجعة الأدبيات ذات الصلة، وتسجيلات غير منشورة جمّعت عبر المراسلات الشخصية. علاوة على ذلك، تم تسجيل ثمانية أنواع من الجوارح المدرجة ضمن القائمة الحمراء للأنواع المهددة بخطر الانقراض للإتحاد العالمي لصون الطبيعة Red List IUCN الى جانب القتل المتعمد عبر الصيد الجائر، أعتبر تدمير الموائل، التغيرات المناخية، والتلوث من المهددات التي تؤثر سلبا على مجتمعات الجوارح في أهوار بلاد الرافدين مما يدعو الى أتخاذ أجراءات صون أضافية.