

Diversity of Birds Migrating in the Eastern Hammar Marsh during the Migration Season in Basrah, Iraq

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Abstract: The present study aimed to identify the diversity of migrating birds in the Eastern Hammar Marsh that inhabit the area during their migratory season. The current study was conducted during the period from October 2021 to April 2022. Three sampling sites were selected (Hareer, Al-Salal and Al-Burgah). Fifty-one migratory bird species belonged to seven orders were observed. Order Charadriiformes occupied the first rank giving a percentage of 33% while order Gruiformes was at the last rank with 2%. Al-Burgah site was the dominate site with 50 species against 43 species in Al-Salal and 42 species in Hareer. Moreover, a difference in number of recorded individuals was observed between the study sites: The highest number of individuals was recorded in Al-Burgah followed by Al-Salal and Hareer as following 8524, 7085 and 5003 individuals respectively. This survey indicated that six species are significant conservation priorities in the Iraqi marshlands and are red listed by IUCN. Al-Burgah site is the most preferred for the congregation of migratory bird species and therefore is richer than the other two sites due to the nature and topography of the area.

Keywords: East Hammar Marsh, Birds migration, Diversity, Basrah, Iraq

Introduction

Iraq lies on the flyway of bird's migration between cold northern and the warm southern regions (Boere & Stroud, 2006). Iraqi lands including mountains, plains, lakes, rivers, marshes and deserts. Such variety attracts vagrants from various fauna areas (Habeeb, 2014). Therefore, Iraq is one of most significant area for bird migration, and international organizations consider it to be as one of the most interesting countries regarding to bird migration (Habeeb et al., 2019). The Mesopotamian marshlands of Iraq are unique environment surrounding by the wide arid Middle East zone and slightly to the northwest has distinct characteristics regarding bird abundance (Habeeb et al., 2018). A moderate winter and the abundance of wetlands attract large number of migratory birds to select the area. The variety of habitats and landscapes are an added value in attracting large number of migratory birds in the migration season, as well as the resident birds (Salim & Abed, 2017). Previous studies that recorded some bird species in Eastern Hammar Marsh were limited after restoration in 2003. Abed (2007) surveyed the restored southern

Iraqi marshes, where he recorded 29 species in the Eastern Hammar Marsh. Similarly, Abed (2008) recorded 59 species in the same marsh. On the other hand, Habeeb (2014) recorded 20 species of shorebirds at the muddy littoral zone of East Hammar Marsh. Habeeb et al. (2018) recorded 27 species belonging to four families of shorebirds and one family for wading birds in the Eastern Hammar Marsh. Previous studies did not represent that the Iraqi marshlands possess the elements that qualify them to be habitats for the migration of birds and as stopover sites on the route (for resting and feeding) of their migration from north to south. Therefore, this study focused on the ecological importance of Iraqi marshlands through highlighting on the bird biodiversity contents of this region. The current study covered one migratory season with different numbers of migratory birds visiting the area.

Methodology

Study Site

Eastern Hammar Marsh represents the southeastern part of the wide Iraqi southern wetlands. The Eastern Hammar Marsh is supplied with a large amount of water from the Shatt Al-Arab River, and groundwater (Mohamed & Hussain, 2012). This marsh includes vast intertidal zone extending more than 33 km near Al-Rumallah oil field (Hussain & Sabar, 2020). Therefore, the vegetation cover and vast mudflats form excellent attractions factors for different species of birds (Scott, 1995).

Three sites were chosen to survey the migratory birds in Eastern Hammar Marsh: the first site was Hareer (N: 30° 35' 59"; E: 47° 41' 19"), the second site was Al-Salal (N: 30° 38' 12.2"; E: 47° 39' 35.9") and the third site was Al-Burgah (N: 30° 41' 27.6"; E: 47° 34' 25.9") as in Figure 1. These sites differ in terms of vegetation cover, mudflats and the presence of terrestrial habitats. Hareer is characterized by the emergence of vast mudflats during the ebb, besides vegetation cover such as *Phragmites australis*, *Typha domingensis* and *Schoenoplectus litoralis* in addition to the presence of small water channels and terrestrial habitats that containing many species of the flowering plants of the genus *Tamarix*. Al-Salal is characterized by the presence of relatively wide mudflats during the ebb, while the vegetation cover like *P. australis*, *T. domingensis* and *S. litoralis* is light in some regions with wide spread of terrestrial habitats of *Tamarix* species. Both Hareer and Al-Salal are deemed as canal marshes. Al-Burgah is an area with openness water (like a lake) and a wide of vegetation cover such as *P. australis*, *T. domingensis* and *S. litoralis* with vast mudflats during ebb.

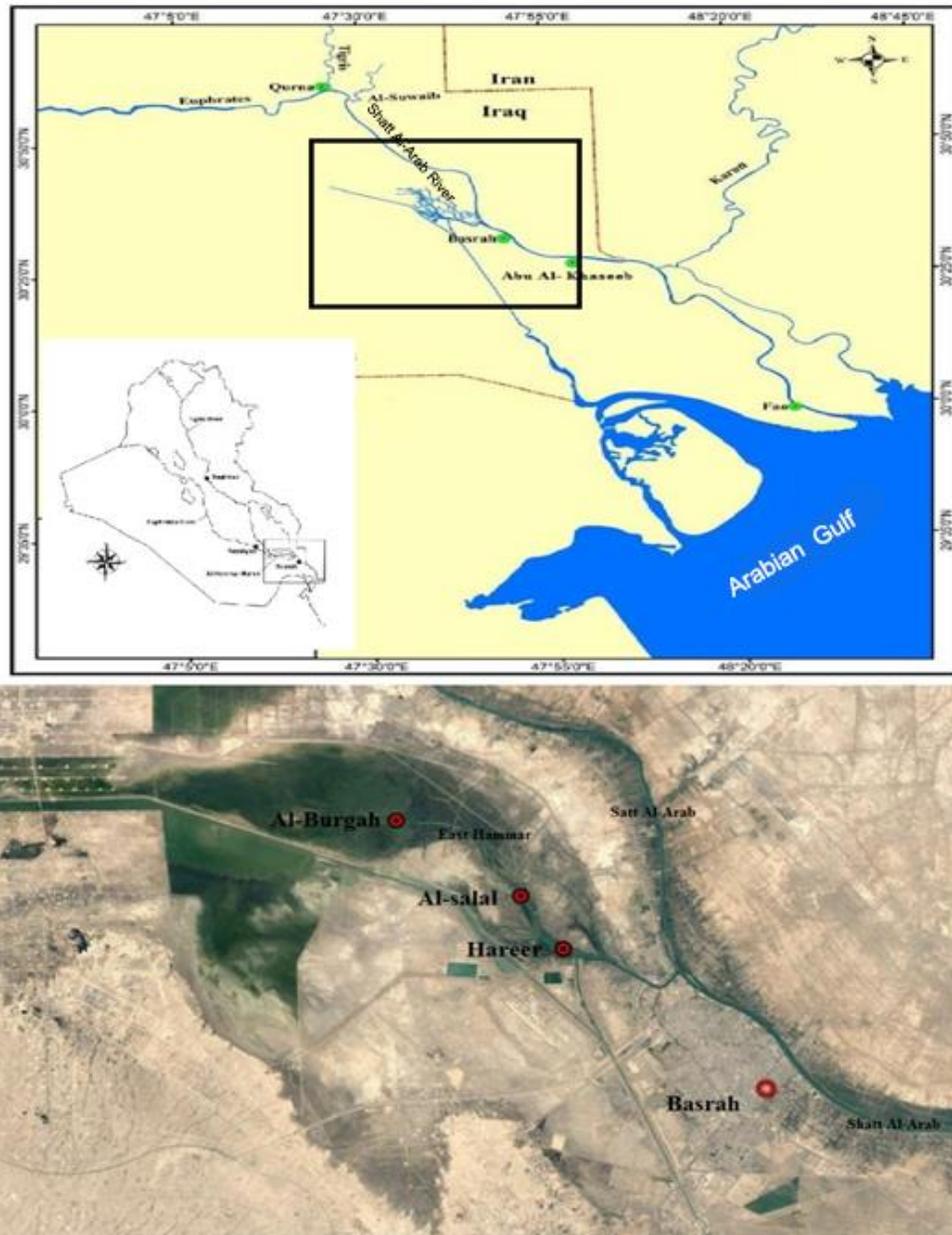


Figure 1: Location of the study area.

Birds Survey

The survey was carried out from October 2021 to April 2022. Field sampling to the Eastern Hammar Marsh was monthly. Point transect (point count) method was used to survey birds species. This method suits dense habitat and population at higher densities and more species richness (Gregory et al., 2015). The field guide of Porter & Aspinall (2010) was used to assist in identifying the observed birds at each sampling site.

Results

Generally, 51 species of migratory birds, belonging to seven orders, were recorded during the study period in Eastern Hammar Marsh in each sites (Table 1). These surveys indicated that six species are in significant conservation priorities in the Eastern Hammar Marsh as listed by IUCN red list: Steppe eagle *Accipiter nipalensis* was endangered while the vulnerable species were: Common pochard *Aythya ferina* and Greater spotted eagle *Clanga clanga*. In addition, the near threatened were: Curlew sandpiper *Calidris ferruginea*, Black-tailed godwit *Limosa limosa* and Armenian gull *Larus armenicus* (Table 1). Percentages of migratory bird species in each orders in the Eastern Hammar Marsh are shown in Figure 2. Charadriiformes occupied the first rank, giving a percentage of 33%, including 17 species. Passeriformes occupied the second rank forming 31%, contained 16 species, while order Anseriformes occupied the third rank with 14% including seven species. It was also noted that Accipitriformes occupied the fourth rank giving a percentage of 12% containing six species. Pelecaniiformes and Ciconiiformes occupied the fifth rank forming 4% including two species for each order, while order Gruiformes was at the last rank with 2% containing one species.

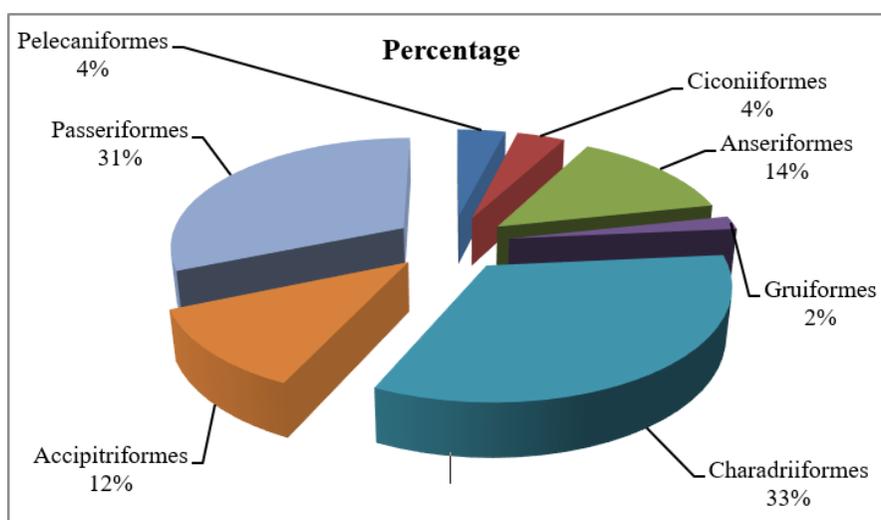


Figure 2: Migratory birds as percentage of species in each order in Eastern Hammar Marsh.

On the other hand, the number of recorded species showed differences between the study sites: Al-Burgah was the dominate site with the number of recording species that was 50 species, while 43 species in Al-Salal and 42 species in Hareer (Figure 3). Moreover, a difference in number of recorded individuals was observed between the study sites: The highest numbers of individuals were recorded in Al-Burgah followed by Al-Salal and Hareer as following 8524, 7085 and 5003 individuals, respectively (Figure 4).

Table 1: Occurrence of migratory birds in the Eastern Hammar Marsh sites during study period with IUCN conservation status.

| Orders | Bird's scientific name | Bird's common name | Status | Conservation status |
|-----------------|-----------------------------------|-------------------------|---------|---------------------|
| Pelecaniformes | <i>Pelecanus onocrotalus</i> | Great White Pelican | WV & PM | LC |
| | <i>Phalacrocorax carbo</i> | Great Cormorant | WV & PM | LC |
| Ciconiiformes | <i>Ardea cinerea</i> | Grey Heron | WV & PM | LC |
| | <i>Ciconia ciconia</i> | White Stork | WV & PM | LC |
| Anseriformes | <i>Aythya ferina</i> | Common Pochard | WV & PM | VU |
| | <i>Tadorna tadorna</i> | Common Shelduck | WV | LC |
| | <i>Anas strepera</i> | Gadwall | WV & PM | LC |
| | <i>A. acuta</i> | Northern Pintail | WV & PM | LC |
| | <i>A. clypeata</i> | Northern Shoveler | WV & PM | LC |
| | <i>A. crecca</i> | Eurasian Teal | WV & PM | LC |
| | <i>Netta rufina</i> | Red-Crested Pochard | WV & PM | LC |
| Gruiformes | <i>Fulica atra</i> | Eurasian Coot | WV & PM | LC |
| Charadriiformes | <i>Philomachus pugnax</i> | Ruff | WV & PM | LC |
| | <i>Charadrius hiaticula</i> | Common Ringed Plover | WV & PM | LC |
| | <i>C. dubius</i> | Little ringed Plover | PM | LC |
| | <i>Tringa glareola</i> | Wood Sandpiper | WV & PM | LC |
| | <i>T. nebularia</i> | Common Greenshank | WV & PM | LC |
| | <i>T. totanus</i> | Common Redshank | WV & PM | LC |
| | <i>T. stagnatilis</i> | Marsh sandpiper | WV & PM | LC |
| | <i>Calidris ferruginea</i> | Curlew Sandpiper | WV & PM | NT |
| | <i>C. minuta</i> | Little Stint | WV & PM | LC |
| | <i>C. alpina</i> | Dunlin | WV & PM | LC |
| | <i>Actitis hypoleucos</i> | Common Sandpiper | WV & PM | LC |
| | <i>Gallinago gallinago</i> | Common Snipe | WV & PM | LC |
| | <i>Arenaria interpres</i> | Ruddy Turnstone | WV & PM | LC |
| | <i>Limosa limosa</i> | Black-tailed Godwit | WV & PM | NT |
| | <i>Larus armenicus</i> | Armenian Gull | WV & PM | NT |
| | <i>L. ichthyaetus</i> | Great Black-Headed Gull | WV | LC |
| | <i>Chroicocephalus ridibundus</i> | Black-headed Gull | WV & PM | LC |
| Accipitriformes | <i>Accipiter nisus</i> | Eurasian Sparrowhawk | WV & PM | LC |
| | <i>Clanga clanga</i> | Greater Spotted Eagle | WV & PM | VU |
| | <i>Aquila nipalensis</i> | Steppe Eagle | WV & PM | EN |
| | <i>Circus cyaneus</i> | Hen Harrier | WV & PM | LC |
| | <i>Buteo rufinus</i> | Long-Legged Buzzard | WV & PM | LC |
| | <i>Pandion haliaetus</i> | Osprey | WV & PM | LC |
| Passeriformes | <i>Phoenicurus phoenicurus</i> | Redstart | PM | LC |
| | <i>Oenanthe isabellina</i> | Isabelline Wheatear | WV & PM | LC |
| | <i>Delichon urbica</i> | House Martin | PM | LC |
| | <i>Lanius collurio</i> | Red-backed Shrike | PM | LC |
| | <i>L. minor</i> | Lesser grey Shrike | PM | LC |
| | <i>L. senator</i> | Woodchat Shrike | PM | LC |
| | <i>L. nubicus</i> | Masked Shrike | PM | LC |
| | <i>Sturnus vulgaris</i> | Common Starling | WV | LC |
| | <i>Motacilla alba</i> | White Wagtail | WV & PM | LC |
| | <i>M. cinerea</i> | Grey Wagtail | WV & PM | LC |
| | <i>M. flava</i> | Western Yellow Wagtail | PM | LC |
| | <i>Acrocephalus schoenobaenus</i> | Sedge Warbler | PM | LC |
| | <i>Phylloscopus collybita</i> | Common Chiffchaff | WV & PM | LC |
| | <i>Cettia cetti</i> | Cetti's Warbler | WV | LC |
| | <i>Anthus trivialis</i> | Tree Pipit | PM | LC |
| | <i>Emberiza calandra</i> | Corn Bunting | WV | LC |

Status: WV: Winter visitor, PM: Passage migrant (Habeeb et al., 2021).

Conservation status according to Bird Life International (IUCN Red List for birds) 2017: LC: Least concern, NT: Near threatened, VU: Vulnerable, EN: Endangered

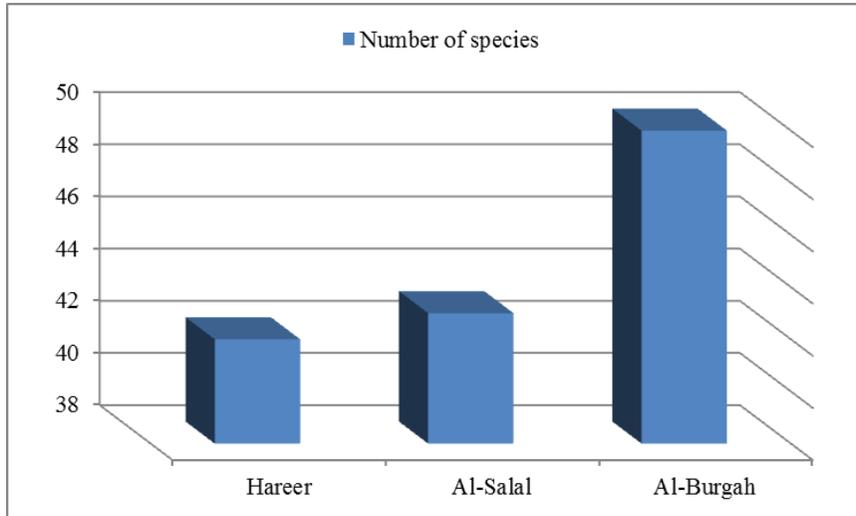


Figure 3: The variation in number of bird species in each site.

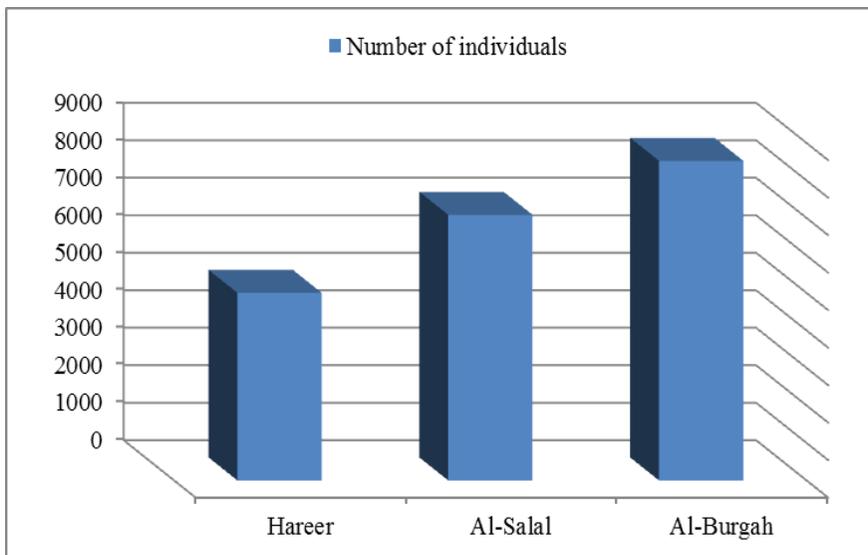


Figure 4: The variation in number of bird individuals in each site.

Figure 5 shows that the highest number of bird species were 46 in March in Al-Burgah, while the lowest number (21 species) was recorded in October in both Hareer and Al-Salal.

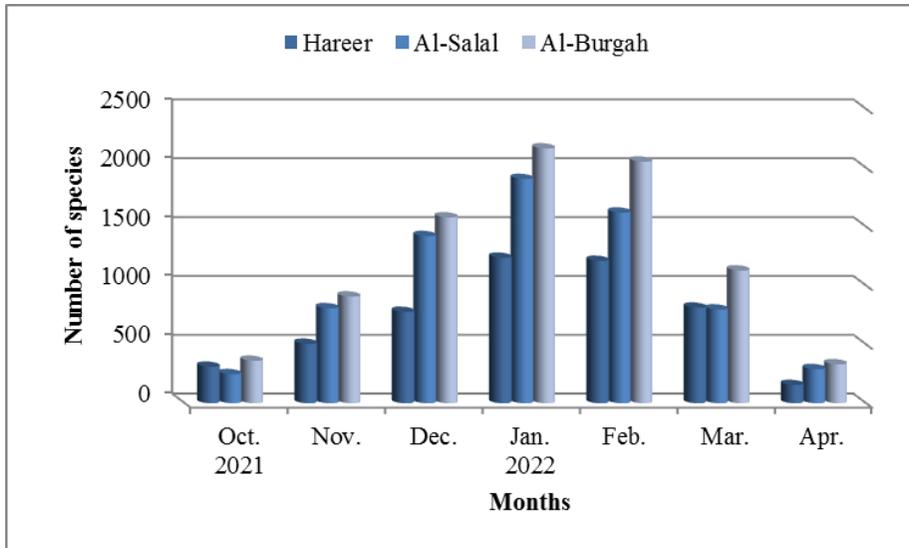


Figure 5: Monthly variation in existence of number of birds migrating species in Eastern Hammar Marsh.

Furthermore, the highest number of individuals was 2165 at January in Al-Burgah, while the lowest number was 247 in April at Al-Salal site (Figure 6).

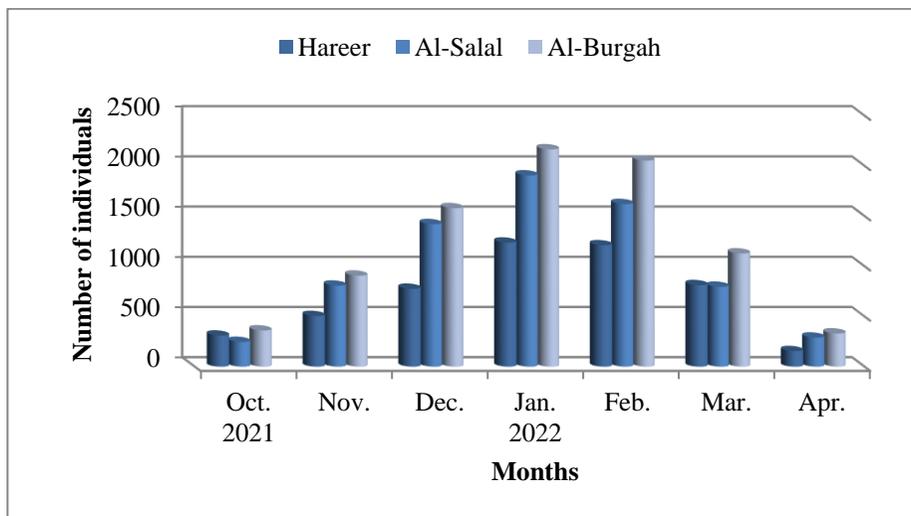


Figure 6: Monthly variation in existence of individuals of birds migrating in Eastern Hammar Marsh.

In general, the highest number of species and individuals recorded during the current study was in Al-Burgah site. Obviously, the highest number was recorded during this study was for dunlin species *C. alpina* giving 1205, 1700 and 1870 individuals in Hareer, Al-Salal and Al-Burgah, respectively. The little stint *C. minuta*

occupied the second rank giving 934, 1321 and 1706 individuals in Hareer, Al-Salal and Al-Burgah, respectively.

Discussion

The mosaic habitats within the study site included vast vegetation cover, wide mudflats and appropriate waterbodies, which was reflected in the presence of large numbers of diversity birds, especially migratory birds. These birds may be found on the vegetation cover, such as passerines, or on the mudflats, like shorebirds and wading birds, or waterfowls, such as ducks and gulls. The Bird Life International (2017) classified Iraqi marshlands, especially Eastern Hammar Marsh, as an important bird's area based on several factors, including the location of the area on the main flyway of bird's migration from Siberia to Africa, the mild climate, the presence of vast waterbodies, vegetation cover and abundance of food.

Rely on the results of the current study, and the bird census during the migration season of the fieldwork, it is apparent that the various in the habitats in the Eastern Hammar Marsh region makes it as one of the richest area in avifauna. Therefore, it is noted that the level of richness in migratory bird species is high. Seven orders of birds were recorded in this study. Most of them were migratory water birds, as they included five orders, while the other birds belonged to two orders. The presence of a wide mudflat provides water birds with more space to exist in this area, and this is in agreement with Scott (1995). The vast mudflats of Eastern Hammar Marsh are considered as perfect area for shorebirds and wading birds (Habeeb, 2014). Therefore, it was noted that the order Charadriiformes (shorebirds and wading birds) recorded the largest number of species and individuals due to the suitability of habitat, as high individuals were recorded in all sites.

The presence of vegetation cover is an important characteristic for the existence of species of the order Passeriformes, which came in the second rank in terms of number of species, as the vegetation cover provides a safe shelter and resting places. This agrees with Al-Robaae & Habeeb (2011). Moreover, the presence of the vast waterbodies has encouraged many waterfowl's individuals (ducks and coots) to stay in this area. On the other hand, the existence of some threatened migratory bird species in Eastern Hammar Marsh gives significant insight into the importance of the region and why it is competent for conservation. This fact concurs with Salim & Abed (2017). Six threatened species that have been recorded in this area belong to three orders, which should be placed under the protection of conservation legislations at various wetlands throughout Iraq (Abed et al., 2014).

Depending on the results of the current study, the Al-Burgah site was the most selected area, in terms of number of species and individuals, over the other sites is due to the presence of extensive waterbodies during the tide, which attract many species of ducks and coots in large numbers, in addition to the presence of a very wide mudflats during the ebb period, which attracts huge number of species and individuals of shorebirds and wading birds, beside of vegetation cover which is providing a shelter for passerines species. Based on the results, it was found that the dunlin *C. alpina* recorded the highest abundance among the other species, and the

little stint *C. minuta* came in the second rank. The reason is attributed to the presence of wide mudflats, which provide an appropriate area for feeding these shorebirds due to the plenty of food, especially invertebrates.

Conclusions

The great diversity of habitats of the Eastern Hammar Marsh is an important factor that contributes to the wildlife richness at this region especially birds. The migrating birds use the diversity habitats that supply shelter and food. The region also harbors huge concentration of waterfowls and large numbers of passerines during the migration season in autumn, winter and spring. A major proportion of the birds noted in this region were under some types of threat, which make it an area competent for conservation and environmental management, either declared a nature reserve or another type of protected area. A notable, but dangerous list of threats, was noted during the extensive fieldwork in the area. The main threats that the avifauna in Eastern Hammar Marsh area facing is hunting and overhunting (especially ducks and coots). Hunting was observed not only with guns, but also with poison and this is a serious precedent for the bird community.

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