

Unifying Sixty-Five Years of Ornithological Records in Azraq Wetland Reserve, Jordan: A Comprehensive Checklist and Conservation Evaluation

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Received: June 12, 2025; Revised: July 24, 2025; Accepted: August 16, 2025

Abstract:

The Azraq Wetland Reserve, located in eastern Jordan, is the only permanent wetland in the hyper-arid northern Arabian Desert and an essential habitat along the Eastern Palearctic-African flyway. The reserve encompasses a mudflat habitat covering approximately 62 square kilometers, representing the lowest topographic point in the region. receiving surface runoff and inflows from all surrounding wadis. Due to its hydrological significance and habitat characteristics, it supports high densities of waterbirds and has been designated as a Ramsar Site of International Importance. This study presents a unified and annotated checklist of bird species recorded in the Azraq Wetland Reserve between 1960 and 2025, based on historical expeditions, published literature, institutional monitoring programs, and recent field surveys. A total of 328 species are documented, each classified by scientific name, common names in English and Arabic, IUCN Red List status, and seasonal presence in the Azraq region. Among these, fourteen species are Near Threatened, eight Vulnerable, four Endangered, and two Critically Endangered. Despite the loss of natural spring discharge since the early 1990s, artificial water pumping has maintained limited wetland functions, enabling the site to continue supporting wetland-dependent biodiversity. This checklist provides a comprehensive baseline for ongoing ecological monitoring and conservation planning in the Azraq Wetland Reserve.

Keywords:

Flyway migration; Habitat fragmentation; Avian hotspots; Ecological functionality, Wetland restoration

Introduction

Azraq Oasis is the only permanent wetland within the hyper-arid northern Arabian Desert, located approximately 85 km east of Amman, Jordan (31°50'N, 36°50'E) (Scates, 1966). It lies at the junction of basaltic formations to the north and limestone-flint geology to the south, occupying the center of the Azraq Basin—a closed inland catchment spanning 12,710 km², of which 94% lies within Jordan, with minor portions in Syria and Saudi Arabia (Bender, 1975; Nelson, 1973). The basin is a gently sloping plateau, with elevations ranging from 1,576 m above sea level in southern Syria to 500 m at the Qa of Azraq, the lowest point of the depression (Al-Kharabsheh, 2000).

The hydrology of Azraq is primarily driven by a basalt aquifer system extending from Jabal al-Arab to the center of the basin, where it historically surfaced via artesian springs, creating the oasis. Secondary sources include deep paleo water from the Tulul al-Ashaqif highlands and thermal flows through fault systems, while shallow aquifers are intermittently recharged by seasonal runoff (Abu-Jaber *et al.*, 1998). These inputs sustained a diverse wetland system comprising permanent freshwater marshes, pools, and a large seasonally flooded Qa (Scates, 1966). Historically, the permanent wetland area—excluding the Qa—covered approximately 26 km².

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The Mudflat (Qa'a Al-Azraq) covers an area of approximately 62 km² and represents the lowest point within the Azraq region, with its lowest elevation reaching 480 meters above sea level. It serves as the collection point for all surface runoff from surrounding wadis and constitutes an important habitat for migratory and resident waterbirds. Since the mudflat was fenced in 2017, vegetation has significantly increased due to the cessation of grazing, enhancing the habitat's ecological value by providing food resources for migratory and resident birds.

From earliest times, Azraq was a vital freshwater refuge, shaping human settlement and economy. Bedouin tribes relied on the marshes for grazing and water, while later waves of Druze and Chechen migrants established villages in the early 20th century. The wetlands supported duck hunting, fishing, salt extraction, and water buffalo grazing (Nelson, 1973; UNDP, 1993, 1995). Conservation initiatives began in the 1960s, with early ecological surveys and a proposed national park (Hemsley and George, 1966). Azraq was declared a Ramsar site in 1977 and later a protected wetland reserve under the management of the Royal Society for the Conservation of Nature (RSCN), with the first formal management plan issued in 1980 (Conder, 1980). Groundwater abstraction for urban supply began in the early 1980s, drastically reducing spring discharge—from 14–16 million m³/year in the 1960s to near zero by 1992 (Scott, 1995). A national restoration initiative was developed in the early 1990s, with support from the Global Environment Facility (GEF), aiming to restore 10% of the former wetland through artificial recharging. Currently, water is supplied through two plastic pipelines, delivering only 750,000 m³/year—half the target volume. This supports a fragmented system of three surface pools, reed-covered canals, and seasonal flood zones (RSCN, internal data). The site continues to provide partial ecological functionality, sustaining limited wetland-dependent biodiversity and maintaining its symbolic conservation value in Jordan.

As part of the habitat restoration plan approved in 2005, a new pool was established in the northern area of the reserve in 2016 (Swiss Pool), covering an area of approximately 25 dunums. This pool constitutes approximately 50% of the total area of permanent pools within the reserve. A hydraulic infrastructure, consisting of a network of pipes connected to the internal pumping station, was implemented to ensure a continuous and controlled water supply, thereby maintaining the ecological functionality of this water body.

For migratory birds, the Azraq Wetland Reserve functions as an ecological “island” of wetland habitat within the otherwise barren Eastern Desert (Ellis, 2017). Its geographic position along the Eastern Palearctic-African flyway makes it a site of critical importance for refueling and resting during long-distance migration (Melling, 1999). As a result, the site has received considerable ornithological attention, with surveys conducted in 1999, 2000, 2004, 2006, 2009, 2011, 2014, 2017, and 2023. These efforts, alongside published works such as *Azraq: Desert Oasis* by Bryan Nelson and *The Birds of the Hashemite Kingdom of Jordan* by Ian Andrews, have documented a rich avian community composed of both migratory and resident species.

Despite this body of work, the avifaunal data on Azraq remain fragmented and dispersed across unpublished reports, short-term studies, and isolated publications. No unified, annotated checklist currently exists that consolidates all known records or assesses the status of each species in the context of the Azraq region. This lack of synthesis presents a critical gap in knowledge that limits the capacity for evidence-based conservation planning, ecological monitoring, and habitat management. In response, the present study aims to compile a comprehensive and standardized checklist of bird species recorded in Azraq Oasis and its surrounding basin. The checklist integrates historical and contemporary sources to clarify species

taxonomy, residency status, and conservation relevance, and provides a scientific baseline to support future biodiversity assessments and wetland protection initiatives.

Materials and Methods

Extensive ornithological surveys took place in the Azraq Wetland Reserve date back to the early 1960s, with significant foundational work led by D.I.M. (Ian) Wallace, James Ferguson-Lees, Guy Mountfort, and other members of the British conservation delegation. Between 1963 and 1967, Wallace participated in multiple expeditions that documented the scale of spring bird migration through Azraq, estimating that hundreds of thousands of passerines passed through the oasis during peak periods—a magnitude that exceeded contemporaneous records from Habbaniya (Wallace, 1982; 1983a). These early studies not only provided the first quantified estimates of migration patterns but also laid the groundwork for Azraq's eventual designation as a Ramsar site. Additional historical insights were offered in Azraq: Desert Oasis by Bryan Nelson (1973), who directed the International Biological Programme research station in 1967.

Building upon this historical foundation, our study consolidates six decades of avifaunal records from Wallace's expeditions, Nelson's fieldwork, the Royal Society for the Conservation of Nature (RSCN), and modern bird monitoring conducted in 1999, 2000, 2004, 2006, 2009, 2011, 2017, and 2023. These more recent surveys—primarily led by RSCN and implemented by Pete Ellis, Tim Melling, and Tim Strudwick in cooperation with the RSPB and Jordanian ornithologists—were further supplemented by verified records from Jordan Birdwatch and the Jordan Bird Records Committee (JBRC). This effort culminates in the first unified, annotated checklist of bird species recorded in Azraq. In addition to the National Waterbird Census, coordinated in Jordan for over 25 years, has provided consistent annual winter count data from

Azraq Wetland Reserve. This census forms a core component of long-term population monitoring and was integrated into our broader data synthesis, allowing comparison of interannual population trends for key waterbird species. Status assessments were derived from historical literature, expert consultations, and our own field observations. Additionally, avian hotspots were georeferenced using handheld GPS devices and processed through RSCN's GIS unit to generate an updated spatial distribution map across the Azraq Basin.

Fieldwork was conducted during peak migration seasons—spring (March–May) and autumn (September–November)—as well as in the breeding season (April–July) and winter (December–February). Each survey varied in duration, ranging from single-day observations to week-long intensive campaigns. Standard birdwatching methods were employed, including point counts, transect walks, and opportunistic observation. Breeding status assessments followed internationally recognized criteria, such as nest building, feeding of young, and confirmed presence of fledglings.

All rare or new species records were subjected to a multi-step verification process. This included photographic documentation, detailed field notes, and review by experienced ornithologists. Species of high interest or first records for Jordan were submitted to the Jordan Bird Records Committee (JBRC) for formal validation. Only verified records were included in the annotated checklist and spatial database.

Results

This article presents a checklist of bird species recorded in the Azraq Wetland Reserve, Jordan, spanning the period from 1960 to 2025. A total of 329 species have been compiled based on data from historical expeditions, published literature, institutional monitoring programs, and recent field observations. Each species entry

includes the English and Arabic common names, scientific name, IUCN Red List category, and recorded status in the Azraq region using standardized codes for seasonal presence and breeding status. These codes distinguish between resident breeders (R), passage migrants (PM), winter visitors (WV), occasional breeders (ob), non-breeding summer visitor (SV), vagrants (V), summer breeder (SB), former breeder (fb) transient (t), and other relevant categories, based on multi-source verification.

According to the IUCN Red List, the documented avifauna includes 14 Near Threatened (NT) species, eight Vulnerable (VU), four Endangered (EN), and two Critically Endangered (CR). Notable threatened species include the Sociable Lapwing (*Vanellus gregarius*, CR), Yellow-breasted Bunting (*Emberiza aureola*, CR), Steppe Eagle (*Aquila nipalensis*, EN), and

Saker Falcon (*Falco cherrug*, EN). Several wetland-dependent species of conservation concern have also been recorded, such as the Marbled Duck (*Marmaronetta angustirostris*, NT), Ferruginous Duck (*Aythya nyroca*, NT), and Black-tailed Godwit (*Limosa limosa*, NT). In addition, the checklist includes a wide range of passage migrants and wintering species, such as the Common Teal (*Anas crecca*), Common Redshank (*Tringa totanus*), and Black-headed Gull (*Chroicocephalus ridibundus*), as well as breeding residents like the Graceful Prinia (*Prinia gracilis*), the introduced White-spectacled Bulbul (*Pycnonotus xanthopygos*).

The spatial distribution of bird observation records within the Azraq Wetland Reserve was mapped using georeferenced field data collected between 1999 and 2025. The resulting Bird Distribution Map (Figure 1)

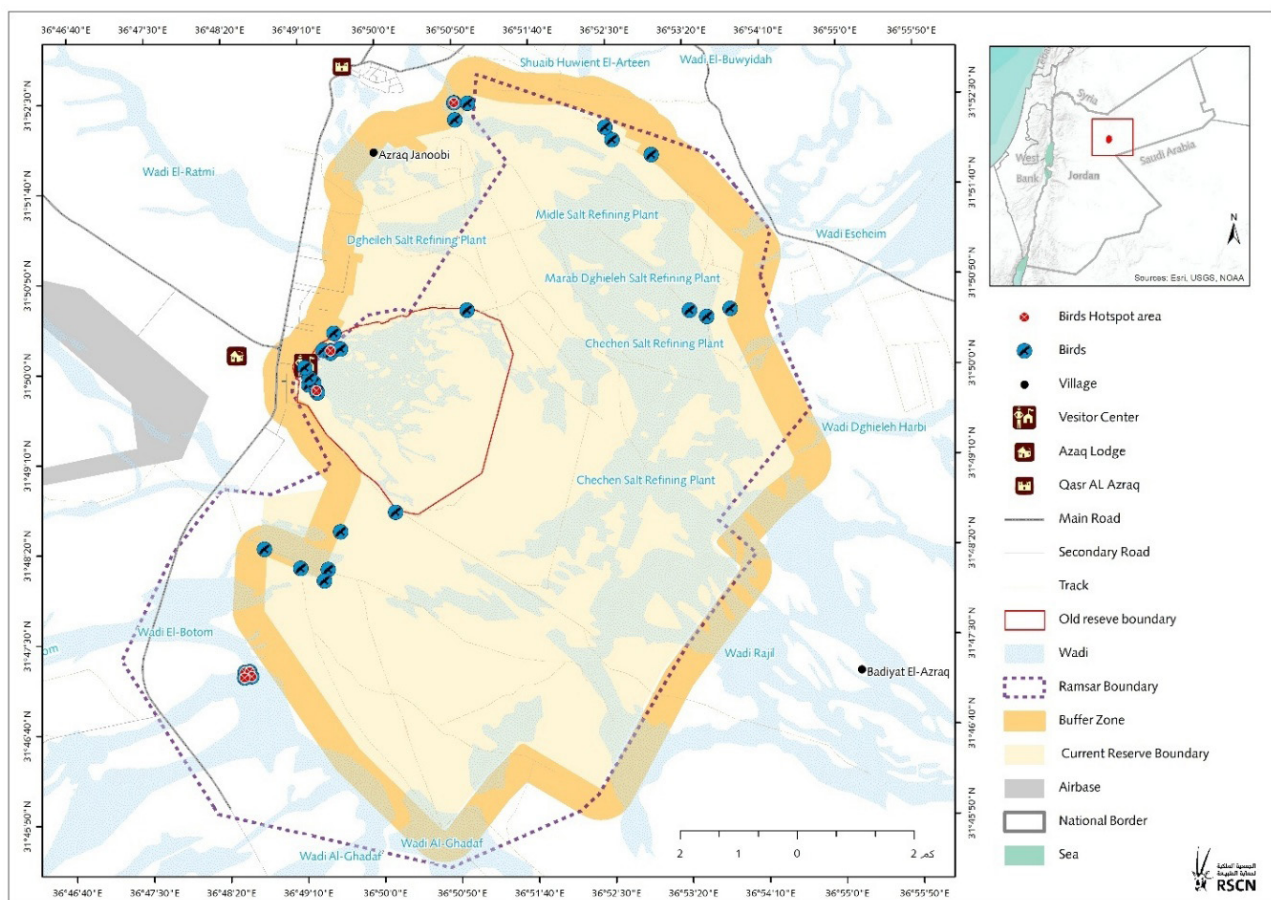


Figure 1. Bird Distribution Map.

identifies specific locations of repeated bird observations within and around the reserve. Concentration points are located primarily in the central-western part of the Ramsar site, particularly near the Visitor Center, Qasr Al Azraq, and Azraq Lodge. Additional hotspots are recorded in the southern and eastern areas, including sites near Wadi El-Botom and Wadi Rajil. Further observation clusters appear adjacent to salt refining plants such as Dgheich, Marab Dgheich, and Chechen Salt Refining Plant.

The checklist (Table 1) constitutes the primary output of the study and is intended to provide a verified reference dataset for ongoing ecological assessments, avian

monitoring programs, and conservation planning in the Azraq Basin.

Figure 1 (Bird Distribution Map) illustrates the bird distribution areas within the Azraq Wetland Reserve and its buffer zone and Ramsar boundary in Jordan, identified based on species richness and population density. The map was created using data collected through intensive field studies, seasonal bird monitoring programs, and daily observations conducted across the reserve. The highlighted areas represent zones of high ornithological importance, providing critical habitats for both resident and migratory bird species. The map also includes relevant features such as the reserve boundaries, salt refining plants, roads, wadis, and the locations of the Azraq Lodge and Visitor Center.

Table 1. Checklist of bird species recorded in Azraq Wetland Reserve, Jordan, from 1960 to 2025, including scientific and common names, IUCN Red List status, and seasonal presence in the Azraq region.

No	Common Name	Scientific Name	Arabic Name	IUCN Red List	Status in Azraq
1	Mute Swan	<i>Cygnus olor</i>	تم اخرس	LC	V
2	Greater White-fronted Goose	<i>Anser albifrons</i>	إوزة غراء كبيرة	LC	V
3	Grey Lag Goose	<i>Anser anser</i>	الوزة الريداء	LC	V
4	Mallard	<i>Anas platyrhynchos</i>	ابو حشيش/الخضاري	LC	R, WV
5	Common Shelduck	<i>Tadorna tadorna</i>	شهرمائه	LC	ob,PM,WV
6	Ruddy Shelduck	<i>Tadorna ferruginea</i>	البط الأحمر	LC	WV
7	Gadwall	<i>Mareca strepera</i>	السماري	LC	WV
8	Falcated Duck	<i>Mareca falcata</i>	حذف منجلي	NT	V
9	Northern Pintail	<i>Anas acuta</i>	البيلبول	LC	PM,WV
10	Northern Shoveler	<i>Spatula clypeata</i>	أبو مجرف	LC	ob,PM
11	Marbled Duck	<i>Marmaronetta angustirostris</i>	الحذف المرقط	NT	V
12	Common Teal	<i>Anas crecca</i>	الشرشير الشتوي	LC	PM,WV
13	Garganey	<i>Anas querquedula</i>	الشرشير الصيفي	LC	PM
14	Common Pochard	<i>Aythya ferina</i>	بطة حمراء رأس	VU	PM,WV
15	Red-crested Pochard	<i>Netta rufina</i>	الكوشرة	LC	PM,WV
16	Ferruginous Duck	<i>Aythya nyroca</i>	الحمراوي أبيض العين	NT	PM,ob
17	Tufted Duck	<i>Aythya fuligula</i>	ابو خصلة	LC	PM,WV
18	Common Goldeneye	<i>Bucephala clangula</i>	ذهبية العين الشائعة	LC	V
19	SMEW	<i>Mergellus albellus</i>	بلقشة بيضاء	LC	V
20	Red-breasted Merganser	<i>Mergus serrator</i>	بلقشة حمراء الصدر	LC	V
21	Chukar	<i>Alectoris chukar</i>	الشنار	LC	R
22	Sand Partridge	<i>Ammoperdix heyi</i>	الحجل	LC	R

No	Common Name	Scientific Name	Arabic Name	IUCN Red List	Status in Azraq
23	Common Quail	<i>Coturnix coturnix</i>	السمان	LC	PM,(SB?)
24	Corncrake	<i>Crex crex</i>	سَلَوَى	LC	PM
25	Little Grebe	<i>Tachybaptus ruficollis</i>	الغطاس الصغير	LC	SB ,WV ,R
26	Great Crested Grebe	<i>Podiceps cristatus</i>	غطاس متوج	LC	PM,WV
27	Black Necked Grebe	<i>Podiceps nigricollis</i>	غطاس أسود الرقبة	LC	PM
28	Great White Pelican	<i>Pelecanus onocrotalus</i>	البجع الأبيض	LC	PM
29	Great Cormorant	<i>Phalacrocorax carbo</i>	غراب البحر الأسود	LC	PM
30	Great Bittern	<i>Botaurus stellaris</i>	الواق الكبير	LC	WV
31	Little Bittern	<i>Ixobrychus minutus</i>	الواق الصغير	LC	SB,PM,(R?)
32	Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	بلشون الليل اسود التاج	LC	t,PM,WV
33	Striated Heron	<i>Butorides striata</i>	البلشون المخطط	LC	V
34	Cattle Egret	<i>Bubulcus</i>	بلشون ابيض كبير	LC	PM,WV
35	Squacco Heron	<i>Ardeola ralloides</i>	الواق الأبيض	LC	PM
36	Little Egret	<i>Egretta garzetta</i>	البلشون الصغير	LC	t,PM,WV
37	Western Reef-Heron	<i>Egretta gularis</i>	بلشون البحر	LC	t
38	Great White Egret	<i>Ardea alba</i>	البلشون الأبيض الكبير	LC	PM,WV
39	Grey Heron	<i>Ardea cinerea</i>	مالك الحزين الرمادي	LC	t,PM,WV
40	Purple Heron	<i>Ardea purpurea</i>	مالك الحزين الأرجواني	LC	PM,fb
41	Goliath heron	<i>Ardea goliath</i>	مالك الحزين الكبير	LC	V
42	White Stork	<i>Ciconia ciconia</i>	اللقق الأبيض	LC	PM,SV
43	Black Stork	<i>Ciconia nigra</i>	لقق اسود	LC	PM
44	Glossy Ibis	<i>Plegadis falcinellus</i>	أبو منجل الأسود	LC	PM,SV
45	Eurasian Spoonbill	<i>Platalea leucorodia</i>	أبو ملعقة	LC	PM
46	Greater Flamingo	<i>Phoenicopterus roseus</i>	النحام	LC	WV
47	Black Vulture	<i>Aegypius monachus</i>	نسر اسود	NT	V
48	Egyptian Vulture	<i>Neophron percnopterus</i>	الرخمة المصرية	EN	PM
49	Osprey	<i>Pandion haliaetus</i>	العقاب النساري	LC	PM
50	Golden Eagle	<i>Aquila chrysaetos</i>	العقاب الذهبي	LC	R
51	Imperial Eagle	<i>Aquila heliaca</i>	ملك العقاب	VU	PM,WV
52	Lesser Spotted Eagle	<i>Clanga pomarina</i>	العقاب الأسفع الصغير	LC	PM
53	Spotted Eagle	<i>Clanga clanga</i>	العقاب الأسفع الكبير	VU	PM
54	Steppe Eagle	<i>Aquila nipalensis</i>	عقاب السهول(بوحق)	EN	PM,WV
55	Short-toed Eagle	<i>Circaetus gallicus</i>	عقاب الحيات	LC	PM
56	Booted Eagle	<i>Hieraaetus pennatus</i>	عُقَابٌ مُسَيَّرَةٌ	LC	PM
57	Black Kite	<i>Milvus migrans</i>	حداة سوداء	LC	PM
58	Western Marsh Harrier	<i>Circus aeruginosus</i>	مرزة البطانج	LC	fb,PM,WV
59	Hen Harrier	<i>Circus cyaneus</i>	مرزة الدجاج	LC	PM,WV
60	Montagu's Harrier	<i>Circus pygargus</i>	مرزة مونتاكو	LC	PM
61	Pallid Harrier	<i>Circus macrourus</i>	المرزة الباهتة	NT	PM,WV
62	Long-legged Buzzard	<i>Buteo rufinus</i>	الحميق	LC	WV
63	Steppe(common) buzzard	<i>Buteo buteo vulpinus</i>	الصقر الحوام	LC	PM
64	Rough-Legged Buzzard	<i>Buteo lagopus</i>	الصقر الحوام المسرول	LC	V

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65	European Honey-buzzard	<i>Pernis apivorus</i>	صقر العسل	LC	PM
66	Crested Honey Buzzard	<i>Pernis ptilorhynchus</i>	صقر العسل المتوج	LC	V
67	Eurasian Sparrowhawk	<i>Accipiter nisus</i>	الباشق	LC	PM,WV
68	Goshawk	<i>Accipiter gentilis</i>	الباز الأوراسي	LC	V
69	Levant Sparrowhawk	<i>Accipiter brevipes</i>	بيدق مشرقى	LC	PM
70	Black-winged Kite	<i>Elanus caeruleus</i>	حداة سوداء الكتف	LC	R
71	Common Kestrel	<i>Falco tinnunculus</i>	عوسق شائع	LC	R,PM
72	lesser kestrel	<i>Falco naumanni</i>	العويسق	LC	PM
73	Red-footed Falcon	<i>Falco vespertinus</i>	الزريق	VU	PM
74	Eurasian Hobby	<i>Falco subbuteo</i>	شُوَيْهِيْنْ أَوْرَاسِيْ	LC	PM
75	Eleonora's Falcon	<i>Falco eleonora</i>	صقر اليونورا	LC	V
76	Peregrine Falcon	<i>Falco peregrinus</i>	الشاهين	LC	PM,WV
77	Merlin	<i>Falco columbarius</i>	اليؤيؤ	LC	WV
78	Saker Falcon	<i>Falco cherrug</i>	صقر الغزال	EN	PM,WV
79	Lanner	<i>Falco biarmicus</i>	صقر وكري	LC	V
80	Water Rail	<i>Rallus aquaticus</i>	مرعة الماء	LC	fb,PM,WV
81	Spotted Crake	<i>Porzana porzana</i>	المرعة المنقطة	LC	PM
82	Baillon's Crake	<i>Zapornia pusilla</i>	مرعة صغيرة	LC	fb,PM
83	Little Crake	<i>Zapornia parva</i>	المرعة الصغيرة	LC	PM
84	Common Moorhen	<i>Gallinula chloropus</i>	فُرْفُرْ شَائِعْ	LC	R,PM,WV
85	Eurasian Coot	<i>Fulica atra</i>	عَرَاءْ أَوْرَاسِيَّةْ	LC	R,WV
86	Common Crane	<i>Grus grus</i>	الكركي الشائع	LC	PM,WV
87	Macqueen Bustard	<i>Chlamydotis macqueenii</i>	الحبارى	VU	fb
88	Pied Avocet	<i>Recurvirostra avosetta</i>	النكات	LC	ob,PM
89	Black-winged Stilt	<i>Himantopus himantopus</i>	كرسوع أبو المغازل	LC	SB,PM
90	Eurasian stone-curlew	<i>Burhinus oedipnemos</i>	الكروان الصحراوي	LC	R
91	Cream-coloured Courser	<i>Cursorius cursor</i>	دُرَّاجْ شَائِعْ	LC	SB
92	Collared Pratincole	<i>Glareola pratincola</i>	يُسْرْ مَطَوَّقْ	LC	ob,PM
93	Black-winged Pratincole	<i>Glareola nordmanni</i>	ابو اليسر اسود الجناح	NT	V
94	Little Ringed Plover	<i>Charadrius dubius</i>	الزقراق المطوق الصغير	LC	SB,PM
95	Common Ringed Plover	<i>Charadrius hiaticula</i>	زُقْرَاقْ مَطَوَّقْ شَائِعْ	LC	PM,WV
96	Kentish Plover	<i>Charadrius alexandrinus</i>	الزقراق الاسكندراني	LC	R,PM,WV
97	Greater Sand Plover	<i>Charadrius leschenaultii</i>	قطقاط الرمل الكبير	LC	SB,PM
98	Grey Plover	<i>Pluvialis squatarola</i>	قطقاط رمادي	LC	PM
99	Eurasian Dotterel	<i>Charadrius morinellus</i>	القطقاط الأغبر	LC	WV
100	Caspian Plover	<i>Charadrius asiaticus</i>	زقراق قزويني	LC	V
101	Northern Lapwing	<i>Vanellus vanellus</i>	زقراق شامي	NT	PM,WV
102	Spur-winged Lapwing	<i>Vanellus spinosus</i>	الزقراق ابو ظفر	LC	R

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103	Sociable Lapwing	<i>Vanellus gregarius</i>	قطقاط اجتماعي	CR	V
104	White-tailed Lapwing	<i>Vanellus leucurus</i>	قطقاط ابيض الذيل	LC	ob,PM
105	(Red) Knot	<i>Calidris canutus</i>	دريجة الشمال	NT	V
106	Sanderling	<i>Calidris alba</i>	المدروان	LC	V
107	Dunlin	<i>Calidris alpina</i>	طَيْطَوَى كَبْدَاء	LC	PM,WV
108	Curlew Sandpiper	<i>Calidris ferruginea</i>	طيطوي مقوس المنقار	NT	PM
109	Temminck's Stint	<i>Calidris temminckii</i>	دريجة تمنك	LC	PM
110	Little Stint	<i>Calidris minuta</i>	فطيرة صغيرة	LC	PM,WV
111	Wood Sandpiper	<i>Tringa glareola</i>	طيطوي الغاب	LC	PM
112	Green Sandpiper	<i>Tringa ochropus</i>	الطيطوي الأخضر	LC	PM,WV,SV
113	Common Sandpiper	<i>Actitis hypoleucos</i>	طَيْطَوَى شَائِعَة	LC	PM,WV
114	Common Redshank	<i>Tringa totanus</i>	حَمْرَاء ساق	LC	PM,WV
115	Spotted Redshank	<i>Tringa erythropus</i>	الطيطوي الداكن	LC	PM
116	Common Greenshank	<i>Tringa nebularia</i>	طيطوي أخضر الساق	LC	PM,WV
117	Marsh Sandpiper	<i>Tringa stagnatilis</i>	طيطوي البطائح	LC	PM
118	Broad-billed Sandpiper	<i>Calidris falcinellus</i>	طيطوي شذفاء	VU	PM
119	Terek Sandpiper	<i>Xenus cinereus</i>	طيطوي نكات	LC	V
120	Black-tailed Godwit	<i>Limosa limosa</i>	البقويقة السلطانية سوداء الذيل	NT	PM , WV
121	Eurasian Curlew	<i>Numenius arquata</i>	كروان الماء أو الكروان الأوراسي	LC	PM
122	Eurasian whimbrel	<i>Numenius phaeopus</i>	كروان الماء الصغير	LC	PM
123	Common Snipe	<i>Gallinago gallinago</i>	شَنْقَب شَائِع	LC	PM,WV
124	Red-necked phalarope	<i>Phalaropus lobatus</i>	طيطوي الماء	LC	PM
125	Ruff	<i>Calidris pugnax</i>	الحجالة	LC	PM,WV
126	Black-headed Gull	<i>Chroicocephalus ridibundus</i>	نورس اسود الرأس	LC	PM,WV,SV
127	Slender-billed Gull	<i>Chroicocephalus genei</i>	النورس مستدق المنقار	LC	PM,WV,SV
128	Pallas's Gull	<i>Ichthyaetus ichthyaetus</i>	نورس السمك	LC	PM,WV
129	Common Gull	<i>Larus Canus</i>	النورس	LC	WV
130	Caspian Gull	<i>Larus cachinnans</i>	نورس قزوين	LC	V
131	Lesser Black-backed Gull	<i>Larus fuscus</i>	النورس اسود الظهر الصغير	LC	PM,WV
132	Little Gull	<i>Hydrocoloeus Minutus</i>	النورس الصغير	LC	PM
133	Little Tern	<i>Sternula albifrons</i>	الخطاف الصغير	LC	SB/ob,PM
134	Sandwich Tern	<i>Sterna sandvicensis</i>	خرشنة الساندويش	LC	V
135	Gull-billed Tern	<i>Gelochelidon nilotica</i>	الخطاف النيللي	LC	ob,PM
136	Common Tern	<i>Sterna hirundo</i>	خَرْشَنَة شَائِعَة	LC	PM
137	Arctic tern	<i>Sterna paradisaea</i>	الخطاف القطبي	LC	V
138	Caspian Tern	<i>Hydroprogne caspia</i>	الخطاف القزويني	LC	V
139	Black Tern	<i>Chlidonias niger</i>	خرشنة سوداء	LC	PM
140	White-winged Tern	<i>Chlidonias leucopterus</i>	خطاف مستنقعات ابيض الجناح	LC	PM,WV
141	Whiskered Tern	<i>Chlidonias hybrida</i>	الخطاف الملتحي	LC	PM
142	Black bellied sandgrouse	<i>Pterocles orientalis</i>	القطا الكَثْرِي	LC	WV
143	Pin-tailed sandgrouse	<i>Pterocles alchata</i>	القطا العراقي	LC	fb(R?)

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144	Spotted Sandgrouse	<i>Pterocles senegallus</i>	القطا المرقط	LC	R
145	Chestnut-bellied Sandgrouse	<i>Pterocles exustus</i>	قطا كستنائي البطن	LC	V
146	Turnstone	<i>Arenaria interpres</i>	أو قنبرة الماء	NT	V
147	Rock Dove	<i>Columba livia</i>	الحمام الأزرق	LC	R
148	Stock dove	<i>Columba oenas</i>	الحمام الأزرق الشمالي	LC	WV
149	Common Woodpigeon	<i>Columba palumbus</i>	وَرَشَانٌ	LC	WV
150	Namaqua Dove	<i>Oena capensis</i>	الحمامة طويلة الذنب	LC	R,SB,PM
151	Collared Dove	<i>Streptopelia decaocto</i>	اليمامة المطوقة	LC	R
152	European Turtle Dove	<i>Streptopelia turtur</i>	الحمامة الرقمية	VU	PM
153	Laughing Dove	<i>Spilopelia senegalensis</i>	اليمام الضاحك	LC	R
154	Common Cuckoo	<i>Cuculus canorus</i>	وقواق شائع	LC	PM
155	Great spotted cuckoo	<i>Clamator glandarius</i>	الوقواق المنقط الكبير	LC	PM
156	Pharaoh Eagle Owl	<i>Bubo ascalaphus</i>	بومة صحراوية (الفرعونية)	LC	R
157	Eurasian Eagle Owl	<i>Bubo bubo</i>	البومة النسارية	LC	R
158	Long-eared Owl	<i>Asio otus</i>	البومة الأذناء	LC	PM
159	Short-eared Owl	<i>Asio flammeus</i>	البومة الصمعاء	LC	PM,WV
160	Barn Owl	<i>Tyto alba</i>	الهامة/بومة المخازن	LC	R
161	Little Owl	<i>Athene noctua</i>	البومة الصغيرة	LC	R
162	Eurasian Scops Owl	<i>Otus scops</i>	الثنج الأوروبي	LC	PM
163	Pallid Scops-owl	<i>Otus brucei</i>	الثنج المخطط	LC	R
164	European Nightjar	<i>Caprimulgus europaeus</i>	سُبْدٌ أَوْزُوبِيٌّ	LC	PM
165	Egyptian Nightjar	<i>Caprimulgus aegyptius</i>	سُبْدٌ مِصْرِيٌّ	LC	(SB?),PM
166	Nubian nightjar	<i>Caprimulgus nubicus</i>	السبد النوبي	LC	R
167	Common Swift	<i>Apus apus</i>	سمامة شائعة	LC	PM
168	Pallid Swift	<i>Apus pallidus</i>	السمامة الباهتة	LC	PM
169	Alpine swift	<i>Tachymarptis melba</i>	السمامة الجبلية	LC	PM
170	Little Swift	<i>Apus affinis</i>	السمامة الصغيرة	LC	R
171	Eurasian Hoopoe	<i>Upupa epops</i>	هُدْهُدٌ أَوْرَاسِيٌّ	LC	R,PM
172	Common Kingfisher	<i>Alcedo atthis</i>	رَفْرَفَاتٌ شَائِعٌ	LC	PM,WV
173	White-throated Kingfisher	<i>Halcyon smyrnensis</i>	السَّمَكَ أبيض الصدر	LC	R
174	Pied Kingfisher	<i>Ceryle rudis</i>	السَّمَكَ الأَبْقَع	LC	V
175	European Bee-eater	<i>Merops apiaster</i>	الوروار	LC	PM
176	Blue-cheeked Bee-eater	<i>Merops persicus</i>	الوروار أزرق الخدين	LC	SB,PM
177	European Roller	<i>Coracias garrulus</i>	الشقراق	LC	PM
178	Wryneck	<i>Jynx torquilla</i>	لَوَّاءٌ أَوْرَاسِيٌّ	LC	PM
179	Eurasian Skylark	<i>Alauda arvensis</i>	الزرعي	LC	WV
180	Oriental Skylark	<i>Alauda gulgula</i>	قبرة حقلية شرقية	LC	WV
181	Crested Lark	<i>Galerida cristata</i>	قبرة متوجة	LC	R

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182	Greater Short-toed Lark	<i>Calandrella brachydactyla</i>	قبرة السهوب	LC	fb,PM
183	Mediterranean Short-toed Lark	<i>Alaudala rufescens</i>	قبرة السهوب الصغيرة	LC	SB,PM
184	Desert Lark	<i>Ammomanes deserti</i>	القبرة الصحراوية	LC	R
185	Bar-tailed Desert Lark	<i>Ammomanes cincturus</i>	قبرة سوداء الرأس	LC	R
186	Dunn's Lark	<i>Eremalauda dunni</i>	قبرة الرمال	LC	R
187	Calandra Lark	<i>Melanocorypha calandra</i>	قبرة كلاندر	LC	WV
188	Thick billed Lark	<i>Ramphocoris clotbey</i>	عصفور قبرة سمكة المنقار	LC	R
189	Temminck's Horned lark	<i>Eremophila bilopha</i>	قبرة مقرنة	LC	R
190	Hoopoe lark	<i>Alaemon alaudipes</i>	القبرة الهددية	LC	R
191	Bimaculated Lark	<i>Melanocorypha bimaculata</i>	قبرة مرقطة	LC	V
192	Sand Martin	<i>Riparia riparia</i>	خطاف الشواطئ	LC	PM
193	Eurasian Crag Martin	<i>Ptyonoprogne rupestris</i>	عَوْهُقُ جُرْفِيٍّ أَوْ رَاسِيٍّ	LC	PM,WV
194	Rock Martin	<i>Ptyonoprogne fuligula</i>	خطاف الصخور	LC	R
195	Barn Swallow	<i>Hirundo rustica</i>	خُطَّافُ المَخَازِن	LC	R,PM
196	Red- rumped swallow	<i>Cecropis daurica</i>	السنونو أحمر العجز	LC	PM
197	Common House Martin	<i>Delichon urbicum</i>	خطاف المدن الشائع	LC	PM
198	Tawny Pipit	<i>Anthus campestris</i>	ابو تمرة الأصفر	LC	PM
199	Long-billed Pipit	<i>Anthus similis</i>	ابو تمرة طويل المنقار	LC	PM
200	Richard's Pipit	<i>Anthus richardi</i>	جشنه ريتشاردية	LC	PM
201	Water Pipit	<i>Anthus spinoletta</i>	ابو تمرة الماء	LC	WV
202	Meadow Pipit	<i>Anthus pratensis</i>	ابو تمرة الحقول	LC	PM,WV
203	Tree Pipit	<i>Anthus trivialis</i>	ابو تمرة الشجر	LC	PM,WV
204	Red- throated pipit	<i>Anthus cervinus</i>	ابو تمرة أحمر الزور	LC	PM,WV
205	White wagtail	<i>Motacilla alba</i>	الدُّعْرَة البيضاء	LC	PM,WV
206	Western Yellow Wagtail	<i>Motacilla flava</i>	دُعْرَة الربيع	LC	fb,PM
207	Citrine Wagtail	<i>Motacilla citreola</i>	ذعرة ليمونية	LC	PM
208	Grey Wagtail	<i>Motacilla cinerea</i>	الذعرة الرمادية	LC	PM
209	Dunnock	<i>Prunella modularis</i>	عصفور الشوك الاوروبي	LC	V
210	European Robin	<i>Erithacus rubecula</i>	ابو الحناء	LC	WV
211	White-throated Robin	<i>Iranian gutturalis</i>	ابو الحن ابيض الزور	LC	PM
212	Common Nightingale	<i>Luscinia megarhynchos</i>	هَزَارُ شَائِع	LC	PM
213	Thrush Nightingale	<i>Luscinia luscinia</i>	الهزاز	LC	PM
214	Rufous-tailed Scrub-Robin\bush	<i>Cercotrichas galactotes</i>	ابو الحناء الأحرش الأحمر	LC	SB,PM
215	Bluethroat	<i>Luscinia svecica</i>	ازرق الزور	LC	PM,WV
216	Common Redstart	<i>Phoenicurus phoenicurus</i>	حُمَيْرَاءُ شَائِعَة	LC	PM

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217	Black Redstart	<i>Phoenicurus ochruros</i>	أبو الحناء أبيض الزور	LC	PM,WV
218	Isabelline Wheatear	<i>Oenanthe isabellina</i>	الأبلق الأشهب	LC	PM
219	Northern Wheatear	<i>Oenanthe oenanthe</i>	الأبلق	LC	PM
220	Black-eared wheatear	<i>Oenanthe hispanica</i>	أبلق أسود الأذن	LC	PM
221	Cyprus Wheatear	<i>Oenanthe cypriaca</i>	الأبلق القبرصي	LC	PM
222	Finsch's Wheatear	<i>Oenanthe finschii</i>	الأبلق العربي	LC	WV
223	Mourning Wheatear	<i>Oenanthe lugens</i>	الأبلق الحزين	LC	R
224	Hooded Wheatear	<i>Oenanthe monacha</i>	الأبلق أبو قلنسوة	LC	R
225	White-crowned Wheatear	<i>Oenanthe leucopyga</i>	الأبلق أبيض القنة	LC	R
226	Blackstart	<i>Oenanthe melanura</i>	قليعي أسود الذيل	LC	R
227	Desert Wheatear	<i>Oenanthe deserti</i>	أبلق صحراوي	LC	R
228	Kurdish Wheatear	<i>Oenanthe xanthoprymna</i>	أبلق أحمر الذيل	LC	V
229	Red-rumped Wheatear	<i>Oenanthe moesta</i>	الأبلق أحمر العجز	LC	R
230	Basalt Wheatear	<i>Oenanthe warriae</i>	أبلق البازلت		R,?
231	Whinchat	<i>Saxicola rubetra</i>	القليعي الأحمر	LC	PM
232	European Stonechat	<i>Saxicola rubicola</i>	القليعي المطوق	LC	PM,WV
233	Eastern Stonechat	<i>Saxicola maurus</i>	قليعي سيبيري		PM,WV
234	Song Thrush	<i>Turdus philomelos</i>	السمنة المطربة	LC	WV
235	Redwing	<i>Turdus iliacus</i>	حمراء الجناح	NT	V
236	Mistle Thrush	<i>Turdus viscivorus</i>	سمنة الدبق	LC	WV
237	Fieldfare	<i>Turdus pilaris</i>	سمنة حقليّة	LC	WV
238	Eurasian Blackbird	<i>Turdus merula</i>	شحرور	LC	R, WV
239	Blue Rock Thrush	<i>Monticola solitarius</i>	سمنة الصخور الزرقاء	LC	PM
240	Common Rock Thrush	<i>Monticola saxatilis</i>	سمنة صخرية	LC	PM
241	Barred Warbler	<i>Curruca nisoria</i>	هازجة (دخلة) عربية	LC	PM
242	Garden Warbler	<i>Sylvia borin</i>	دخلة البساتين	LC	PM
243	Eurasian Blackcap	<i>Sylvia atricapilla</i>	هازجة مقلنسة اوراسية	LC	PM
244	Lesser Whitethroat	<i>Curruca curruca</i>	زريقة فيرانية صغرى	LC	PM
245	Arabian Warbler	<i>Curruca leucomelaena</i>	الهازجة العربية	LC	R
246	Sardinian Warbler	<i>Curruca melanocephala</i>	هازجة سردينا	LC	WV
247	Menetries's Warbler	<i>Curruca mystacea</i>	هازجة الطرفاء	LC	PM
248	Rüppell's Warbler	<i>Curruca ruppeli</i>	دخلة روبيل	LC	PM
249	Common Whitethroat	<i>Curruca communis</i>	زُوراء شائعة	LC	PM
250	Spectacled Warbler	<i>Curruca conspicillata</i>	الدخلة ذات النظارة	LC	R,WV
251	Orphean Warbler	<i>Curruca crassirostris</i>	الدخلة المغنية	LC	PM
252	Subalpine Warbler	<i>Curruca cantillans</i>	دخلة الصرود	LC	PM
253	Asian Desert Warbler	<i>Curruca nana</i>	دخلة الصحراء	LC	PM,WV
254	Graceful Prinia	<i>Prinia gracilis</i>	الهازجة طويلة الذنب	LC	R
255	Scrub Warbler	<i>Scotocerca inquieta</i>	هازجة الشجيرات	LC	R
256	Sedge Warbler	<i>Acrocephalus schoenobaenus</i>	هازجة السعد	LC	PM

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257	Aquatic Warbler	<i>Acrocephalus paludicola</i>	هازجة الماء	VU	V
258	Moustached Warbler	<i>Acrocephalus melanopogon</i>	الهازجة ذات الشارب	LC	fb,WV
259	Zitting Cisticola	<i>Cisticola juncidis</i>	الهازجة مروحية الذنب	LC	R
260	Common Grasshopper-warbler	<i>Locustella naevia</i>	دخلة جنديبة شائعة	LC	PM
261	River Warbler	<i>Locustella fluviatilis</i>	دخلة نهريّة	LC	PM
262	Savi's Warbler	<i>Locustella luscinioides</i>	هازجة الغاب	LC	fb,PM
263	Cetti's Warbler	<i>Cettia cetti</i>	بلشون البقر ابو قردان	LC	PM
264	Eurasian Reed Warbler	<i>Acrocephalus scirpaceus</i>	هازجة القصب	LC	SB,PM,WV
265	Marsh Warbler	<i>Acrocephalus palustris</i>	دخلاء مستنقعية	LC	PM
266	Blyth's Reed Warbler	<i>Acrocephalus dumetorum</i>	دَخْنَاءُ إِبْلَيْيَّةٌ	LC	V
267	Paddyfield Warbler	<i>Acrocephalus agricola</i>	هازجة الأرز	LC	V
268	Great Reed Warbler	<i>Acrocephalus arundinaceus</i>	هازجة القصب الكبيرة	LC	fb,PM
269	Clamorous Reed-warbler	<i>Acrocephalus stentoreus</i>	دخلاء صخباء	LC	fb
270	Basra Reed-warbler	<i>Acrocephalus griseldis</i>	هازجة قصب البصرة	EN	V
271	Icterine Warbler	<i>Hippolais icterina</i>	دخلاء ليمونية	LC	V
272	Olive-tree Warbler	<i>Hippolais olivetorum</i>	دخلاء شجر الزيتون	LC	PM
273	Upcher's Warbler	<i>Hippolais languida</i>	الخنشع الشجري	LC	PM
274	Eastern Olivaceous Warbler	<i>Iduna pallida</i>	دخلاء زيتونية	LC	SB,PM
275	Booted Warbler	<i>Iduna caligata</i>	هازجة منتعلة	LC	PM
276	Willow Warbler	<i>Phylloscopus trochilus</i>	نقشارة الصفصاف	LC	PM
277	Wood Warbler	<i>Phylloscopus sibilatrix</i>	نقشارة الغابة	LC	PM
278	Eastern Bonelli's Warbler	<i>Phylloscopus orientalis</i>	دخلة بونلية شرقية	LC	PM
279	Common Chiffchaff	<i>Phylloscopus collybita</i>	ذعرة شائعة	LC	PM,WV
280	Spotted Flycatcher	<i>Muscicapa striata</i>	خطاف الذباب المنقط	LC	PM
281	Red-breasted Flycatcher	<i>Ficedula parva</i>	خطاف الذباب احمر الصدر	LC	PM
282	European Pied Flycatcher	<i>Ficedula hypoleuca</i>	خطاف الذباب الأبقع	LC	PM
283	Semicollared Flycatcher	<i>Ficedula semitorquata</i>	خطاف الذباب شبه المطوق	LC	PM
284	Collared Flycatcher	<i>Ficedula albicollis</i>	خاطف الذباب المطوق	LC	PM
285	Eurasian Penduline Tit	<i>Remiz pendulinus</i>	قَرْقَنَّةٌ أَوْرَاسِيَّةٌ	LC	PM, WV
286	Ring-necked parakeet	<i>Psittacula krameri</i>	الببغاء المطوقة	LC	R (introduced)
287	Great Grey Shrike	<i>Lanius excubitor</i>	الصرد الرمادي الكبير	LC	R
288	Lesser Grey Shrike	<i>Lanius minor</i>	الصرد الرمادي الصغير	LC	PM
289	Red-backed Shrike	<i>Lanius collurio</i>	الصرد أحمر الظهر	LC	PM
290	Isabelline Shrike	<i>Lanius isabellinus</i>	الصرد الأشهب	LC	WV

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291	Turkestan Shrike	<i>Lanius phoenicuroides</i>	الصرّد التركستاني	LC	PM
292	Woodchat Shrike	<i>Lanius senator</i>	الصرّد أحمر القنة	NT	PM
293	Masked Shrike	<i>Lanius nubicus</i>	الصرّد المقنع	LC	PM
294	White-spectacled Bulbul	<i>Pycnonotus xanthopygos</i>	كعيت	LC	R
295	White-eared Bulbul	<i>Pycnonotus leucotis</i>	الببلب ابيض الخد	LC	R (introduced)
296	Palestine Sunbird	<i>Cinnyris osea</i>	التمير الفلسطيني	LC	R
297	Arabian babbler	<i>Argya squamiceps</i>	الثرثار العربي	LC	R
298	Jackdaw	<i>Corvus monedula</i>	غراب زرعي	LC	V
299	Rook	<i>Corvus frugilegus</i>	غراب القيط	LC	V
300	Brown-necked Raven	<i>Corvus ruficollis</i>	غراب احمر العنق	LC	R
301	Common Starling	<i>Sturnus vulgaris</i>	زُرْزُورٌ شائع	LC	WV
302	Rosy Starling	<i>Pastor roseus</i>	الزرزور الوردي	LC	PM
303	Eurasian Golden Oriole	<i>Oriolus oriolus</i>	صفيّر ذهبي	NT	PM
304	House Sparrow	<i>Passer domesticus</i>	عصفور دوري	LC	R
305	Spanish Sparrow	<i>Passer hispaniolensis</i>	العصفور الأسباني	LC	R, WV
306	Pale Sparrow	<i>Carpospiza brachydactyla</i>	عصفور صخري شاحب	LC	PM
307	Common Chaffinch	<i>Fringilla coelebs</i>	شرشور ظالم	LC	WV
308	Brambling	<i>Fringilla montifringilla</i>	شرشور جبلي	LC	PM
309	Common Linnet	<i>Linaria cannabina</i>	حَسُونٌ ثَقَاجِيّ	LC	R,WV
310	Goldfinch	<i>Carduelis carduelis</i>	حسون مذهب	LC	R,WV
311	Syrian serin	<i>Serinus syriacus</i>	نعار سوري	VU	PM
312	Common Rosefinch	<i>Carpodacus erythrinus</i>	حسون ورد شائع	LC	V
313	Trumpeter Finch	<i>Bucanetes githagineus</i>	الزَمِير الوردي	LC	R
314	Desert Finch	<i>Rhodospiza obsoleta</i>	الحسون الصحراوي	LC	R
315	Common Reed Bunting	<i>Emberiza Schoenichus</i>	درسة قصبية	LC	WV
316	Ortolan Bunting	<i>Emberiza hortulana</i>	درسة الشعير	LC	PM
317	Cretzschmar's Bunting	<i>Emberiza caesia</i>	درسة زرقاء الرأس	LC	PM
318	Cinereous Bunting	<i>Emberiza cineracea</i>	درسة أورتلان (درسة الشعير)	NT	PM
319	Yellow-breasted bunting	<i>Emberiza aureola</i>	درسة صفراء الصدر	CR	V
320	Corn Bunting	<i>Emberiza calandra</i>	دُرْسَةُ قَمْجِيَّة	LC	WV
321	Rock Bunting	<i>Emberiza cia</i>	درسة صخرية	LC	V
322	Striolated Bunting	<i>Emberiza</i>	درسة منزلية	LC	V
		<i>Emberiza</i>	درسة رأساء	LC	PM
323	Black-headed Bunting	<i>melanocephala</i>			
324	Little Bunting	<i>Emberiza pusilla</i>	درسة صغيرة	LC	V
325	Syrian Ostrich	<i>Struthio camelus syriacus</i>	النعام السوري	LC	E
326	Eurasian Wigeon	<i>Mareca penelope</i>	المصوة	LC	PM,WV
327	Indian Silverbill	<i>Euodice malabarica</i>	الحَبَاك الهندي	LC	R (introduced)

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328	Common Myna	<i>Acridotheres tristis</i>	ماينا شائعة	LC	R (introduced)
329	Eurasian Siskin	<i>Spinus spinus</i>	حسون شوكي	LC	WV

The new and rare documentations in the Azraq Wetland Reserve (2018-2025).

A total of 26 new, rare, or locally significant avian records were documented in the Azraq Wetland Reserve between 2018 and 2025 (Table 2). First national breeding records were confirmed for **Ferruginous Duck** (*Aythya nyroca*) in 2020 and 2021, and for **Northern Shoveler** (*Spatula clypeata*) in 2020. In 2025, **Paddyfield Warbler** (*Acrocephalus agricola*) was recorded for the second time in Jordan, with both observations originating from Azraq. The **Basra Reed Warbler** (*Acrocephalus griseldis*) was documented for the first time in Jordan in 2024 at the Swiss Pool. Additional first records for Azraq include **Caspian Gull** (*Larus cachinnans*), **Crested Honey Buzzard** (*Pernis ptilorhynchus*), **Cinereous Vulture** (*Aegypius monachus*), **Rook** (*Corvus frugilegus*), and **Pallid Scops Owl** (*Otus brucei*), with the latter representing only the third national record. Rare migrants and winter visitors included **Asian Desert Warbler** (*Sylvia nana*), **Isabelline Shrike**

(*Lanius isabellinus*), **Short-eared Owl** (*Asio flammeus*), and **Rose-coloured Starling** (*Pastor roseus*), last recorded in Azraq in 1976. Large aggregations were recorded for **Ruff** (*Calidris pugnax*), exceeding 5,000 individuals in May 2025, and for **Purple Heron** (*Ardea purpurea*), with a flock of 55 individuals—both the highest counts documented in Jordan to date. Regular nesting of **Mallard** (*Anas platyrhynchos*) has been confirmed annually since 2018. The first breeding record of **Northern Pintail** (*Anas acuta*) in Jordan and Palestine occurred in 2020 in Azraq. **Red-crested Pochard** (*Netta rufina*) was recorded five times in the Azraq region between 1969 and 2018. A second record of **Common Wood Pigeon** (*Columba palumbus*) was made in 2020, following the only previous sighting in 1966. An albino individual of **Eurasian Coot** (*Fulica atra*) was also observed in 2021. These records provide updated documentation of breeding activity, species occurrence, and seasonal dynamics in the Azraq Wetland Reserve (Table 2).

Table 2. New, rare, and notable bird records documented in Azraq Wetland Reserve between 2018 and 2025, including first national and local occurrences, confirmed breeding events, and rare migratory observations, with corresponding dates and documentation sites.

No	Species	Record Date	Location	Status
1	Caspian Gull	17/10/2023	Azraq Wetland Reserve	First record in Azraq
2	Hybrid Turkestan Shrike	5/10/2023	Azraq Wetland Reserve/Mudflat	First record in Jordan
3	Striated Heron	15/9/2023	Azraq Wetland Reserve	Second record since 2011
4	Ferruginous Duck	4/6/2020 2021	Azraq Wetland Reserve	The first documentation of a breeding case in Jordan and the second breeding documentation near threatened (population decreasing)

No	Species	Record Date	Location	Status
5	Northern Shoveler	11\6\2020	Azraq Wetland Reserve	The first breeding record in Jordan
6	Crested Honey Buzzard	10\5\2023	Azraq Wetland Reserve	first verified observation in the Azraq Wetland Reserve
7	Stone Curlew	5\5\2020	Azraq Wetland Reserve	The second nesting case in Azraq since 2006
8	Eurasian Curlew	1\10\2023	Azraq Wetland Reserve/Mudflat	A rare migrant to Azraq and it Classified according to the Red List as a Near Threatened species (NT).
9	Pallid Scops Owl	14\7\2023	Azraq Wetland Reserve/Mudflat	The first record in Azraq and the third in Jordan.
10	Cinereous Vulture	8\11\2023	Azraq Wetland Reserve	one of the rarest species of vultures in the world and first documentation in Azraq.
11	Mallard		Azraq Wetland Reserve	breeding continuously since 2018 in the Azraq Wetland Reserve.
12	Leucistic coot	12\12\2021	Azraq Wetland Reserve	(Coot) Leucism is a wide variety of conditions that result in partial loss of pigmentation in an animal—causing white, pale, or patchy coloration of the skin, hair, feathers, scales, or cuticles, but not the eyes. It is occasionally spelled leukism. Some genetic conditions that result in a “leucistic”.
13	Common Wood Pigeon	14\10\2020	Azraq Wetland Reserve	The second record of the common wood pigeon in Azraq after 27/4/1966.
14	Rose Coloured Starling	3\5\2020	Azraq Wetland Reserve/Mudflat	recorded as one of the rarest bird species in Jordan, where its last record in Azraq region dates back to 5/28/1976 by (Ian Andrews).
15	Flamingo	17\6\2020	Azraq Wetland Reserve/Mudflat	The first photographic documentation in Azraq and it is considered rare migrant.
16	Asian Desert Warbler	November 2021	Azraq Wetland Reserve/Mudflat	Rare winter visitor.
17	Northern Pintail	16\6\2020	Azraq Wetland Reserve	First breeding case in Jordan and Palestine.
18	Common Pochard	18\10\2019	Azraq Wetland Reserve	(Vulnerable) due to IUCN Red List
19	Red Crested Pochard	2\11\2018 15\4\1988 20\4\1984 12\1\1979 29\9\1969	Azraq Wetland Reserve	Very rare winter visitor to Azraq 5 records in Azraq Wetland Reserve
20	Short Eared Owl	24\4\2022	Azraq Wetland Reserve	Rare migrant to Azraq Wetland Reserve

No	Species	Record Date	Location	Status
21	Isabelline Shrike	6\1\2021	Azraq Wetland Reserve	Rare winter visitor to Azraq Wetland Reserve and Jordan
22	Macqueen Bustard	10\5\2022	Azraq Wetland Reserve	Vulnerable (population decreasing)
24	Basra Reed Warbler	June/2024	Azraq Wetland Reserve	First Record in Jordan
25	Rook	2024	Azraq Wetland Reserve	First Record to Azraq and second to Jordan
26	Paddyfield Warbler	8/May/2025	Azraq Wetland Reserve	The second record in Jordan since 2003, and both records are in Azraq.

Discussion

This study documents a total of 329 bird species recorded in the Azraq Wetland Reserve between 1960 and 2025, confirming the site's long-term significance for avian diversity in arid regions of the Levant. Between 2018 and 2025. A total of 26 species were recorded with status updates, new locality records, or verified breeding confirmations. These findings expand the existing ornithological baseline and provide direct evidence of recent changes in species occurrence and reproductive behaviour within the reserve (Table 2).

Confirmed breeding was recorded for Ferruginous Duck (*Aythya nyroca*) in 2021 5 Youngs seen in A pool and for Northern Shoveler (*Spatula clypeata*) in 2020 2 Youngs seen in pool near mudflat, representing a verified breeding cases for these species in Jordan. Northern Pintail (*Anas acuta*) was also confirmed as a breeder in 2020 a 9 young seen in Swiss pool 16/6/2020 , marking the first such case for both Jordan and Palestine. Repeated breeding of Mallard (*Anas platyrhynchos*) from 2018 to 2025, previously classified only as a potential breeder (Nelson, 1973), reflects a shift in local population establishment, likely influenced by managed water input.

High-density observations included a remarkable aggregation of over 5,000 Ruff (*Calidris pugnax*) and 55 Purple Herons

(*Ardea purpurea*), the latter representing the largest known aggregation of this species ever recorded in Jordan. In comparison, data from the study Monitoring of Breeding and Migrant Birds – Azraq Wetland Reserve and Qa' al Azraq, Jordan (2017) documented only 6 individuals of Purple Heron and 3,295 Ruff during the same migratory period. These aggregation events confirm that managed water bodies in Azraq continue to function as critical staging and foraging habitats during migration periods. The Common Wood Pigeon (*Columba palumbus*) was recorded again in 2020 for the first time since its initial documentation in Azraq in 1966, indicating either under-detection or episodic presence. Likewise, Red-crested Pochard (*Netta rufina*) was recorded five times between 1969 and 2018, confirming its status as a scarce but recurring winter visitor to the site. The Hybrid Turkestan shrike was recorded in 2023 for the first time in Jordan and considered a hybrid between the Turkestan Shrike and unknown shrike species that keep the opportunity open for further research. This record has been confirmed by the Jordan Bird Records Committee (JBRC), batch number (27/28) as a recognized hybrid observation.

The documentation of Leucistic Eurasian Coot (*Fulica atra*) in 2021 represents a rare genetic anomaly rather than a population-level indicator, but further reflects the breadth of observation in the reserve. Records of Stone Curlew (*Burhinus oedicnemus*)

breeding in 2020—the first since 2006—provide additional support for continued reproductive use of the reserve's peripheral habitats.

While the natural discharge from Azraq's artesian springs ceased in the early 1990s due to over-extraction (Scott, 1995), the artificial maintenance of wetland pools through managed water pumping has facilitated the continued presence of numerous breeding and migratory species. Nonetheless, the reduced water volume (currently 750,000 m³/year) falls short of the planned 1.5–2.5 million m³/year (RSCN internal data), potentially limiting broader habitat recovery. These results support the designation of Azraq as a site of national and international importance for avian conservation and highlight the need for continuous, standardized long-term monitoring. Particular attention should be given to the breeding status of formerly rare or vagrant species, migratory population fluctuations, and habitat-dependent species vulnerable to hydrological variability.

Furthermore, this research highlights the value of long-term, standardized monitoring for detecting shifts in species composition, distribution, and reproductive behavior. The repeated confirmation of breeding in species previously considered vagrants or rare breeders, along with the discovery of hybrid individuals and the reappearance of birds after decades, illustrates the dynamic nature of the ecosystem and the need for continued surveillance. Such monitoring serves as a foundation for adaptive management strategies, particularly in ecosystems where water availability is tightly linked to species survival.

these findings emphasize that Azraq Wetland Reserve not only retains national conservation value but also serves as a regional model for wetland management in arid environments. They support the continued justification of its Ramsar designation and underscore the urgent need for increased technical and financial investment to ensure the long-term resilience of this ecosystem.

Acknowledgements

We would like to extend our sincere gratitude to Dr. Nashat Hamidan, Director of the Nature Conservation Monitoring Center, for his continuous support and guidance throughout the preparation of this paper. We also wish to thank Laya Majed, GIS Specialist, for her assistance in preparing the map. Our appreciation goes as well to Dr. Fares Khoury for his ongoing support, particularly in assessing the status of bird species and in the classification of newly recorded species. Special thanks are also due to Asmaa Al-Bazour, Ecological Researcher and Herbarium Curator, for providing previous reports and valuable information. We also extend our gratitude to Ansam Al-Ghalilat, Conservation Coordinator in the Protected Area Management Department, and to Mohamed Al-Aqra', Avifauna Researcher in the Nature Conservation Monitoring Center, for their valuable support. Finally, we thank the entire team of staff at Azraq Wetland Reserve for their assistance and cooperation.

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Annex

Notable Records

1. Hybrid Turkistan Shrike`

Location: Azraq wetland reserve mudflat

Photographer: Tamir Aqili

Date: 4/10/2023



2. Paddyfield Warbler

Location: Azraq wetland reserve mudflat

Photographer: Fares Khoury

Date: 8/5/2025

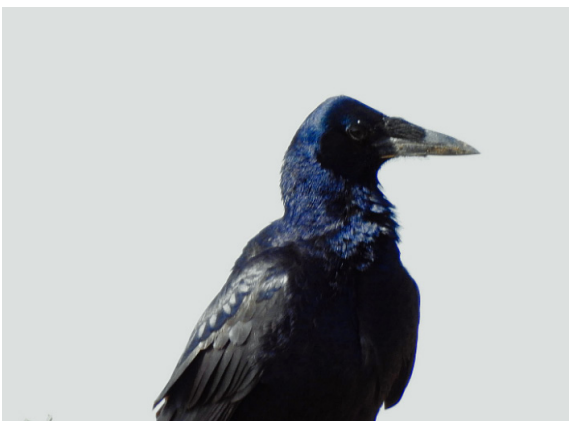


3. Rook

Location: Azraq wetland reserve mudflat

Photographer: Tamir Aqili

Date: 31/10/2024



4. Leucistic coot

Location: Azraq wetland reserve

Photographer: Hazem Alhreisha



5. Greater Flamingo

Location: Azraq wetland reserve mudflat



6. Young Northern Shoveler

Location: Azraq wetland reserve

Photographer: Hazem Alhreisha

Date: 11/6/2020





7. Young Ferruginous duck

Location: Azraq wetland reserve

Photographer: Hazem Alhreisha

Date: 4/6/2020



8. Northern Pintail

Location: Azraq wetland reserve

Photographer: Hazem Alhreisha

Date: 16/6/2020

