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SECOND DOCUMENTED LOCALITY OF THE MEDIUM EGRET *ARDEA INTERMEDIA* IN SAUDI ARABIA: A RECORD FROM ASH-SHAHMAH DAM, KING ABDULAZIZ ROYAL RESERVE

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Abstract. The Arabian Peninsula remains a relatively poorly surveyed region for avian biogeography, where artificial wetlands may provide important stopover and refuge sites for water birds. We report a record of Medium Egret *Ardea intermedia* at Ash-Shahmah Dam within the King Abdulaziz Royal Reserve, Saudi Arabia, on 1 November 2019. This represents the second locality in Saudi Arabia where the species has been documented, following its previous record from Jizan, and provides additional evidence of its occurrence in the country, extending its known distribution to the arid interior north of Riyadh. Recent taxonomic studies have supported the recognition of three distinct species within the former "Intermediate Egret" complex: *Ardea intermedia*, *A. brachyrhyncha*, and *A. plumifera*. Although *A. intermedia* is primarily distributed in South and Southeast Asia, its confirmed occurrence in Saudi Arabia highlights the importance of careful identification of Intermediate-type Egrets in the Arabian Peninsula. Identification outside full breeding plumage remains challenging because of overlap in external characters; therefore, species identification should consider a combination of bill and lores coloration, tibial and tarsal coloration, bill shape, gape position, and overall structural characters. The Ash-Shahmah record, documented within a protected area established in 2018, also highlights the value of protected areas and systematic ornithological monitoring in improving knowledge of the Saudi avifauna and detecting species that may have previously been overlooked.

Saudi Arabia supports a diverse avifauna owing to its geographical position at the junction of the Palearctic, Afrotropical, and Oriental biogeographic regions and its wide range of habitats. The National Centre for Wildlife currently lists 499 bird species in the country, including approximately 180 water bird species, while more than 300 species pass through Saudi Arabia during migration, highlighting the country's importance along major African–Eurasian flyways (National Centre for Wildlife 2026). Birds are sensitive indicators of environmental change because their distribution, abundance, and population trends respond to changes in habitat and environmental conditions (Thongsoulin et al. 2019; Chedad et al. 2023; Gregory and van Strien 2010). Migratory birds are particularly responsive to variation in food availability, weather, and temperature, which influence migration timing, routes, and seasonal distributions (Chedad et al. 2022, 2025; Berthold 1999; Zink 2002; Newton 2008; Somveille et al. 2015). Rapid environmental change, including climate warming and altered food resources, can consequently affect avian behaviour, phenology, population dynamics, and distribution patterns (Oro et al. 2013; Parmesan 2006; Devictor et al. 2008; De'ath et al. 2009; McDermott and DeGroote 2017).

The country's extensive coastline, inland wetlands, reservoirs, oases, wadis, and artificial water bodies provide important habitats for resident and migratory water birds. This importance is reflected in the national network of 39

Important Bird and Biodiversity Areas (IBAs), several of which encompass wetlands and coastal habitats of recognized importance for birds (Boland and Burwell 2020). In response to accelerating climate change and increasing anthropogenic pressures, Saudi Arabia has substantially strengthened its framework for natural resource management through the establishment of an extensive network of royal and national reserves, enhanced public awareness programmes, strengthened field monitoring protocols, and brought forward more stringent wildlife protection legislation. These measures have contributed to improving knowledge of the national avifauna, particularly within the King Abdulaziz Royal Reserve (KARR). Recent systematic surveys in KARR have provided baseline information on the seasonal occurrence and conservation status of threatened migratory birds, further demonstrating the importance of the reserve for migratory avifauna (Alshammari et al. 2026). Continued field investigations have also revealed previously undocumented species records and breeding evidence in Saudi Arabia, demonstrating the value of systematic monitoring for improving knowledge of the national avifauna (Ajarem et al. 2020; Al-Qahtani et al. 2025; Chedad et al. 2026).

Within KARR, recent ornithological studies have substantially expanded the documented avifaunal inventory. These include the first records of nine vagrant bird species for the reserve, highlighting the role of systematic surveys in detecting occasional and poorly documented species (Chedad et al. 2026a), as well as the first confirmed record of Red Phalarope *Phalaropus fulicarius* at KARR, providing additional evidence of the occurrence of rare vagrant water birds in the reserve (Chedad et al. 2026b). Other recent studies have documented the first record of Rüppell's Vulture (*Gyps rueppelli*) for the region (Al-Asmari et al. 2026), the first confirmed nesting of Egyptian Nightjar (*Caprimulgus aegyptius*) in the Kingdom (Chedad et al. 2026c), evidence of breeding range expansion in the Black-winged Kite (*Elanus caeruleus*) (Altalhi et al. 2025), the first evidence of breeding and eastward range expansion by the Mediterranean Short-toed Lark (*Alaudala rufescens*) (Al-Asmari et al. 2025), and the first confirmed record of Pectoral Sandpiper (*Calidris melanotos*) for Saudi Arabia (Al-Qahtani et al. 2025), alongside additional observations that are currently under analysis or awaiting publication. Collectively, these findings demonstrate the continuing contribution of systematic field surveys to documenting species occurrence, migration patterns, breeding activity, and range changes within KARR and more broadly across Saudi Arabia.

Within this context, the record of Medium Egret (*Ardea intermedia*) at Ash-Shahmah Dam, in the King Abdulaziz Royal Reserve, eastern Saudi Arabia, represents the second documented locality of the species in the country and provides additional evidence of its occurrence in the Arabian Peninsula.

We documented a single sighting of a Medium Egret *Ardea intermedia* at Ash-Shahmah Dam (26°06′48.33″N, 45°48′41.35″E; 653 m a.s.l.) within the King Abdulaziz Royal Reserve (KARR), Saudi Arabia, on 1 November 2019, at approximately (10:10) (Figure 1).

The reserve, established in 2018 and included on the IUCN Green List by 2025, covers approximately 28,345 km² and is located about 70 km north of Riyadh, extending across parts of the Riyadh and Eastern Provinces. The Ash-Shahmah Dam forms a small artificial wetland of just over 10 ha within this predominantly arid landscape. The site experiences a hot desert climate characterized by extremely dry and hot summers, mild winters, low annual precipitation of approximately 66 mm, and temperatures ranging from 6.7 °C to 42.8 °C (Almazroui et al. 2012; World Bank 2024; Climate Data 2025; Weather and Spark 2025).

The former "Intermediate Egret" complex, which included African, Asian, and Australasian populations, has undergone substantial taxonomic revision, including changes in generic placement and subsequent recognition of three species: Yellow-billed Egret *Ardea brachyrhyncha*, Plumed Egret *A. plumifera*, and Medium Egret *A. intermedia* (Tu et al. 2017; Walsh and Chafer 2022; del Hoyo et al. 2023; eBird 2023; Heron Conservation 2023). The name "Intermediate Egret" is still encountered in older literature, whereas *A. intermedia* is currently treated as Medium Egret.

Field identification necessitates careful morphological assessment, as the Medium Egret is intermediate in size between the Great Egret *Ardea alba* and the Little Egret *Egretta garzetta*, with a shorter, thicker neck that lacks the pronounced S-curve diagnostic of the former. In full breeding plumage, the Medium Egret exhibits a predominantly black bill with yellowish lores, long filamentous plumes on the back and breast, and crucially no plumes on the head; the legs are entirely black. In non-breeding plumage, identification is complicated by a bill that fades to yellow or bicoloured, rendering birds superficially similar to small Great Egrets or bulky Little Egrets. Under these circumstances, structural characters provide the most reliable diagnostic features: a more compact build relative to the Great Egret, a longer neck and bill than those of the Cattle Egret *Bubulcus ibis*, and a gape line terminating at the posterior margin of the eye rather than extending beyond it (del Hoyo et al. 2023; Heron Conservation 2023).

The Ash-Shahmah individual (Figure 2) was photographed in non-breeding plumage, consistent with the November date of the observation. It showed a bicoloured, yellowish bill and entirely dark legs, together with a build more compact than the Great Egret and



Figure 1. Observation sites of the Medium Egret (*Ardea intermedia*) in Saudi Arabia: the present record from the King Abdulaziz Royal Reserve (KARR), documented in 2019 (green), and the 2025 records from Jazan (red; Saudi Birding 2025).



Figure 2. Records of the Medium Egret *Ardea intermedia* in Saudi Arabia (photos by Bader M. Alqasem).

a neck and bill proportionally longer than those of the Cattle Egret. These structural features, combined with the absence of any orange or pink flush typical of breeding *A. alba*, are consistent with *A. intermedia* and inconsistent with *Egretta garzetta*, which is markedly smaller and slighter-billed.

The breeding distribution extends from Pakistan, India and Sri Lanka eastward through China, Korea and Japan, and southward into the Greater Sundas. The species is currently classified as Least Concern by the IUCN and remains locally common across much of its range. Nevertheless, the global population has not been rigorously quantified (Maddock 2000; Heron Conservation 2023; IUCN 2024).

Within the Arabian Peninsula, the Medium Egret *Ardea intermedia* is a rare visitor, with records historically

concentrated in southern Oman and the United Arab Emirates. Interest in the identification and status of "intermediate-type" egrets in Arabia has grown since the 2023 taxonomic split of the former Intermediate Egret complex into Medium Egret (*A. intermedia*), Yellow-billed Egret (*A. brachyrhyncha*), and Plumed Egret (*A. plumifera*). Separating the two Arabian candidates remains particularly difficult outside the breeding season, when several plumage and bare-part characters overlap – and given Jazan's proximity to the Horn of Africa, either taxon was, in principle, plausible there (Walsh and Chafer 2022). Earlier intermediate-type records from Jazan were in fact first assigned to *A. intermedia* but were reassigned to Yellow-billed Egret once the split took effect; the confirmation of the Asian bird came only in July 2025, when photographs from the same region showed birds in full breeding plumage – black bill, yellow lores, entirely black legs – diagnostic of *A. intermedia* rather than its African counterpart (eBird 2023; Saudi Birding 2025). A first individual was photographed in breeding plumage on 13 July, followed by a group of six on 15 July, five of which showed the same diagnostic features. These records close a real gap in the national avifaunal list and underline how much artificial wetlands and protected areas are still revealing about Saudi Arabia's birdlife.

The Ash-Shahmah Dam observation reported here is thus only the second Saudi Arabian locality where the species has been confirmed, extending its known occurrence from the south-western lowlands to the arid interior north of Riyadh. The fact that an isolated artificial wetland within the King Abdulaziz Royal Reserve should host a species otherwise confined to South and Southeast Asia is perhaps less surprising given that it is already a fairly common passage and winter visitor in Oman, with further records from Qatar and the UAE – and its turning up at two such widely separated Saudi sites hints that such water bodies may serve as more than one-off refuges for drifting vagrants. Seasonal dispersal from the South Asian range, perhaps aided by favourable winds or adverse weather, could plausibly carry birds this far west, though the present evidence falls well short of demonstrating a regular migration route. For now, the two records are best read as further proof that the species can reach well beyond its usual range, not as evidence of an established pathway – and only continued observation, particularly of birds in breeding plumage, will show how often, and from where, these movements actually occur.

We recommend systematic surveys of artificial wetlands across the Kingdom to assess their role as stepping stones for vagrant water birds. Future records of egrets should be documented photographically, with particular attention to bill and lores colouration, to facilitate definitive species-level identification. Moreover, sustained long-term monitoring within recently established reserves such as KARR is essential, as these areas continue to reveal species that were previously overlooked.

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Conflict of interests

The co-authors report no conflicts of interest.

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Data availability

The data used to support the findings of this study are included within the article.

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