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First Record of the Caspian Tern *Hydroprogne caspia* (Charadriiformes: Laridae) in Kalimantan, Indonesia, with A Review of Its Status Across Borneo

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Abstract
The Caspian Tern *Hydroprogne caspia* is a cosmopolitan migratory waterbird and an uncommon non-breeding visitor in Indonesia. Although previously recorded from Sabah, Sarawak, and Brunei Darussalam, the species had not been documented from Indonesian Borneo. Here, we report the first confirmed record of *H. caspia* in Kalimantan, Indonesia. On 2 February 2026, two individuals were observed and photographed on the intertidal mudflats of Kempeng Beach, Central Kalimantan, during the Asian Waterbird Census. Identification was based on their exceptionally large size, massive deep-red bill, and characteristic non-breeding plumage. A review of published literature and citizen-science databases indicates that this record represents a significant southward extension of the species' documented distribution on Borneo. This finding fills an important geographic gap in the known occurrence of *H. caspia* within the East Asian–Australasian Flyway and highlights the importance of southern Borneo's coastal wetlands for migratory waterbirds.

Keywords: Caspian Tern, Central Kalimantan, *Hydroprogne caspia*, Kalimantan, new records.

Introduction

The Caspian Tern *Hydroprogne caspia* is a cosmopolitan migratory seabird that breeds either in colonies or as solitary pairs, typically on sparsely vegetated or unvegetated islets, skerries, and coastal habitats (Ludwig 1965; Cuthbert & Wires 2020). As the sole representative of the genus *Hydroprogne*, it has an exceptionally broad range spanning North America, Europe, Africa, Madagascar, Asia, Australia, and New Zealand (del Hoyo & Collar 2014; Gochfeld & Burger 1996). Recognized as the world's largest tern (Lötberg & Åkesson 2020), it is readily distinguished by its massive bright-red bill, robust head, and relatively shallowly forked tail (Eaton *et al.* 2016; Taufiqurrahman *et al*. 2022).

In Indonesia, *H. caspia* is considered an uncommon migrant, with scattered records from Sumatra, Bali, Sulawesi, Timor, and Papua (Iqbal *et al.* 2020, 2025). Although the species is primarily associated with coastal and marine habitats, it may occasionally occur in inland wetlands during migration (Eaton *et al.* 2016). Despite its extensive global range and occurrence across several Indonesian islands, records from Borneo have historically been restricted to the island's northern regions, namely Sabah and Sarawak in Malaysia and Brunei Darussalam (MacKinnon & Phillipps 1993; Mann 2008).

The apparent absence of *H. caspia* records from Indonesian Borneo is noteworthy. According to Holmes & Burton (1987), migratory terns occur regularly along the southern coast of Kalimantan during the boreal winter; however, observations have been largely limited to commonly recorded species, including the Great Crested Tern *Thalasseus bergii* and the Whiskered Tern *Chlidonias hybrida*. No confirmed records of *H. caspia* have been documented despite Kalimantan's extensive coastline, the

regular occurrence of migratory waterbirds, and increasing ornithological survey effort in the region. Whether this absence reflects ecological constraints, migratory routes, or simply insufficient detection remains uncertain. Consequently, the distribution of *H. caspia* on Borneo is still incompletely understood. Here, we report the first confirmed record of *H. caspia* from Kalimantan, Indonesia, extending the species' known range on Borneo, and review available records to provide an updated assessment of its distribution across the island.

Methods

During the Asian Waterbird Census (AWC) on 2 February 2026, we observed two *H. caspia* with binocular on the mudflats of Kempeng Beach (-3.243960 S, 113.314249 E), Katingan Regency, Central Kalimantan, Indonesia. The individuals were found within a large mixed flock of terns. They were seen staying on the mudflats while occasionally preening. To ensure a definitive identification, we compared them directly with nearby Great Crested Tern *Thalasseus bergii*, Gull-billed Tern *Gelochelidon nilotica* and Whiskered Tern *Chlidonias hybrid*.

As part of the annual monitoring program of Sebangau National Park, Kempeng Beach, located within the park's buffer zone, has been established as a permanent survey site since 2023. Migratory waterbird surveys were conducted across the intertidal zone following the standardized census methodology of Wetlands International (2018). During the survey, photographs were obtained using a high-resolution camera equipped with a telephoto lens to facilitate detailed examination of diagnostic morphological features. Species identification was based on published field references (Eaton *et al*. 2016; Taufiqurrahman *et al.* 2022), confirming the individuals as *H. caspia*. To assess the significance of this record for Indonesian Borneo, we reviewed occurrence data from the eBird and iNaturalist databases, together with published literature (Table 1, Figure 1).



Figure 1. Map showing record of Caspian Terns *Hydroprogne caspia* in Borneo since 2009-2026. The blue dots represent encounters recorded in eBird (2026), the purple dots represent encounters recorded in iNaturalist (2026), and the red dot represent encounter locations at Kempeng Beach, Katingan, Central Kalimantan, Indonesia.

Results and Discussion

Kempeng Beach is located in Kampung Tengah Village, Katingan Kuala District, Katingan Regency, Central Kalimantan, Indonesia. This beach features a 3 km coastline characterized by a thin sandy-mud substrate, with mud depth ranging from 10 to 50 cm. The wave energy in this area is notably calmer compared to steeper coastal environments. This low-energy wave regime supports a highly productive marine microfauna community, particularly crustaceans. According to Birawa & Sukarna (2016), the coastal waters of Katingan Kuala exhibit a rich diversity of micro fauna, such as crustacean. Furthermore, this region serves as a vital nursery, feeding, and spawning ground for shrimp, various commercially important pelagic fish species, and diverse aquatic biota inhabiting both coastal and offshore environments.

The observed individuals were in non-breeding plumage, identified by the significant whitening and fine black streaking on the forehead and crown. They are easily distinguished from the nearby T. bergii, which has a yellowish-tinted bill and a distinct crown pattern during the same period, by their plumage state, enormous deep red beak, and superior body size. As the world's largest tern, the diagnostic dusky primary undersides further solidify the accuracy of this record phase (Lötberg & Åkesson, 2020).



Figure 2. Two *Hydroprogne caspia* with other terns *T. bergii, G. nilotica*, and *C. hybrida* spotted in Kempeng Beach, Central Kalimantan, Indonesia on 2 February 2026 (Photograph: Muhammad Rochim).

Similar to other tern species, the *H. caspia* is a migratory bird in Indonesia, occurring as a regular but low density non-breeding visitor (MacKinnon & Phillipps 1993; Iqbal *et al.* 2020). The sighting of two individuals at Kempeng Beach, Central Kalimantan (Figure 2), represents a significant addition to the region's ornithological records. Similar to other tern species, *H. caspia* is a migratory bird in Indonesia, occurring as a regular but low density non-breeding visitor (Iqbal *et al.* 2020). While MacKinnon & Phillipps (1993) note that this species is widespread across the archipelago, it is more frequently documented along the northern coasts of Java and Wallacea. Thus, the discovery of *H. caspia* on Kempeng Beach suggests that the southern coastline of Borneo Island serves as a vital link and a critical stopover point within the East Asian-Australasian Flyway (EAAF).

Furthermore, their presence within a mixed species flock at Kempeng Beach highlights typical interspecific social behavior. According to Shuford & Craig (2002), *H. caspia* often join mixed species flocks to enhance predator detection and foraging efficiency. This relationship also suggests that Kempeng Beach provides a highly productive environment with a wide variety of ecological niches,

ranging from sandbars for landing and resting, surface foraging behavior, and the need for deep diving by *H. caspia*. After long-distance flights, these resources are crucial for restoring energy reserves (Howes *et al.* 2003).

Tidal dynamics play a crucial role in the temporality of this foraging. Our observations at 10:00 a.m., three hours before the peak of the day's high tide, were the birds' most frequent foraging time. During this high tide, prey organisms are concentrated in shallow, receding pools, making them highly accessible to aerial divers like *H. caspia*. The mudflat substrate, composed of black organic mud mixed with alluvial sand, creates a mosaic of flooded pockets typical of highly productive foraging grounds (Iqbal *et al.* 2021, 2022). These stable yet saturated surfaces are crucial for migratory *Charadriiformes* and *Larids*, providing essential habitat for resting and foraging (MacKinnon & Phillipps (993; Sukmantoro *et al.* 2007).

This sighting highlights Borneo's intertidal zones' ecological relevance from a conservation standpoint. As apex predators within this niche, the presence of *H. caspia* indicates a functional ecosystem capable of supporting multiple trophic levels. However, these vital migratory routes are seriously threatened by the quick conversion of coastal mudflats for aquaculture and other land-use changes (Langendoen *et al.* 2021). Thus, one action that may be taken is to provide official protection for places like Kempeng Beach great priority. This is a crucial step to save the migratory bird population that makes a long-term halt at this spot.

The absence of *H. caspia* in Kalimantan, Indonesia, may reflect observer bias and differences in the number of observers in the field rather than a true biological exception. In citizen science, species distribution maps are often heavily skewed toward areas with higher population densities, better infrastructure, and more established birdwatching communities (Geldmann *et al*., 2016).

The high number of sightings in Sabah and Sarawak is consistent with adequate infrastructure to viewing locations, a strong birdwatching tourism network, and active use of platforms such as eBird or iNaturalist contributors from Sabah and Serawak. In contrast, the extensive and often inaccessible coastline of Kalimantan remains under-surveyed, leading to what is known as spatial sampling bias. This suggests that gaps in *H. caspia* records are more likely data gaps than natural migration boundaries, emphasizing the need for targeted ornithological surveys in the Indonesian part of the island to complete the migration picture. Data on the presence of *H. caspia* in Kalimantan are shown in Table 1.

Table 1. Number and distribution records of *H. caspia* in Borneo, listed by date.

Date	No of Bird(s)	Location	Observer/Source
28/02/2009	1	Kuala Baram, Miri, Sarawak, Malaysia	Bakewel, D. /eBird, 2026
26/03/2009	*Ni*	Kuala Baram, Miri, Sarawak, Malaysia	Wong, A./eBird, 2026
10/5/2009	1	Santubong, Kuching, Malaysia	Warburton G./eBird, 2026
6/9/2009	1	Kuala Baram, Miri, Sarawak, Malaysia	Abghani /eBird, 2026
20/09/2009	2	Bako Buntal Bay, Kuching, Malaysia	Wong, A /eBird, 2026
11/5/2015	1	Trusan Sugut FR, Malaysia	Bakar, John /eBird, 2026
26/11/2017	1	Beluran, Sabah, Malaysia	Huang, Qin /eBird, 2026
26/11/2017	5	Beluran, Sabah, Malaysia	Huang, Qin /eBird, 2026
21/10/2019	1	Kuala Abai, Kota Belud, Malaysia	Reyes, J.B. /eBird, 2026
3/11/2020	1	Kuala Baram, Miri, Sarawak, Malaysia	Bakewel, D. /eBird, 2026
15/12/2020	1	Kuala Baram, Miri, Sarawak, Malaysia	Bakewel, D. /eBird, 2026
24/12/2020	1	Kuala Baram, Miri, Sarawak, Malaysia	Bakewel, D. /eBird, 2026
13/02/2021	2	Sejingkat PSA Ponds, Malaysia	Ng, J.J /eBird, 2026
14/02/2021	3	Sejingkat PSA Ponds, Malaysia	Ng, J.J /eBird, 2026
14/11/2021	1	Kuala Baram, Miri, Sarawak, Malaysia	Bakewel, D. /eBird, 2026
28/11/2022	1	Kuala Baram, Miri, Sarawak, Malaysia	Bakewel, D. /eBird, 2026
5/12/2022	1	Buntal bay, Kuching, Malaysia	Kong, D. /eBird, 2026
21/11/2023	1	Kuala Baram, Miri, Sarawak, Malaysia	Bakewel, D. /eBird, 2026

Date	No of Bird(s)	Location	Observer/Source
19/01/2024	9	Trusan Sugut FR, Malaysia	Migiu,A., Albert, G., Benedict, M.L., Bakar, J. /eBird, 2026
1/12/2024	1	Kuala Abai, Kota Belud, Malaysia	Rajah, R., John, A. /eBird, 2026
14/12/2024	5	Sundar, Sarawak, Malaysia	Noraisah, M., Batrisyia, T., Dave, B./eBird, 2026
23/01/2025	1	Lok Kawi, Kinabalu, Malaysia	Nasri, Razis /eBird, 2026
24/01/2025	1	Lok Kawi, Kinabalu, Malaysia	Voo, Ray /eBird, 2026
29/03/2025	2	Kg Indrasabah, Tawau, Sabah, Malaysia	Bakewel, D. /eBird, 2026
29/03/2025	1	Wakuba, Tawau, Sabah, Malaysia	Shao, S.T., Bakewel, D. /eBird, 2026
1/4/2025	1	Sankina Aquaculture, Tawau, Malaysia	Shao, S.T. /eBird, 2026
28/4/2025	1	Sankina Aquaculture, Tawau, Malaysia	Shao, S.T. /eBird, 2026
29/4/2025	2	Sankina Aquaculture, Tawau, Malaysia	Shao, S.T. /eBird, 2026
15/07/2025	3	Sandakan, Sabah, Malaysia	BenW127/iNaturalist, 2026
15/07/2025	1	Kinabatangan WS, Sabah, Malaysia	Ward, Ben /eBird, 2026
17/11/2025	1	Bako Buntal Bay, Kuching, Malaysia	Ng, J.J, Liew, Y,M., Bakewell, D. /eBird, 2026
18/11/2025	3	Sankina Aquaculture, Tawau, Malaysia	Shao, S.T. /eBird, 2026
20/11/2025	1	Kuala Abai, Kota Belud, Malaysia	Neumann, Nicolas /eBird, 2026
21/11/2025	1	Sankina Aquaculture, Tawau, Malaysia	Shao, S.T. /eBird, 2026
26/11/2025	3	Pulau Gusung, Sabah, Malaysia	Bakar, John /eBird, 2026
26/11/2025	6	Pulau Gusung, Sabah, Malaysia	Shao, S.T. /eBird, 2026
30/11/2025	5	Pulau Gusung, Sabah, Malaysia	Albert, Gary /eBird, 2026
30/11/2025	4	Pulau Gusung, Sabah, Malaysia	Wai Loon Wong /eBird, 2026
30/11/2025	5	Pulau Gusung, Sabah, Malaysia	Migiu, A., Albert, G., Benedict, M.L., Bakar, J. /eBird, 2026
4/12/2025	7	Sankina Aquaculture, Tawau, Malaysia	Shao, S.T. /eBird, 2026
6/12/2025	11	Sankina Aquaculture, Tawau, Malaysia	Shao, S.T. /eBird, 2026
11/12/2025	6	Pulau Gusung, Sabah, Malaysia	Reyes, J.B. /eBird, 2026
11/12/2025	11	Pulau Gusung, Sabah, Malaysia	Chiew KV /eBird, 2026
11/12/2025	6	Sulu Sea, Sabah, Malaysia	Pudin, Ron /eBird, 2026
13/12/2025	23	Kg semawang, Sabah, Malaysia	Benedict, M.L., Choo, C., Mustapha, R.M. /eBird, 2026
23/12/2025	5	Sankina Aquaculture, Tawau, Malaysia	Shao, S.T. /eBird, 2026
3/1/2026	8	Sankina Aquaculture, Tawau, Malaysia	Shao, S.T. /eBird, 2026
11/1/2026	1	Pantai Sambir, Sarawak, Malaysia	Wilibrode, O., Simon H., & Ng, J.J /eBird, 2026
1/2/2026	5	Sankina Aquaculture, Tawau, Malaysia	Shao, S.T. /eBird, 2026
2/2/2026	2	Kempeng Beach, Central Kalimantan, Indonesia	Nugroho, *et al*., 2026
15/2/2026	5	Sankina Aquaculture, Tawau, Malaysia	Shao, S.T. /eBird, 2026
23/2/2026	4	Sankina Aquaculture, Tawau, Malaysia	Shao, S.T. /eBird, 2026
2/3/2026	5	Sankina Aquaculture, Tawau, Malaysia	Pudin, R. , Shao, S.T., Amar-Singh HSS /eBird, 2026
2/3/2026	38	Baton, Belawai, Sarawak, Malaysia	Majri, N., Ng, J.J /eBird, 2026
4/3/2026	5	Sankina Aquaculture, Tawau, Malaysia	Pudin, R. , Shao, S.T., Amar-Singh HSS /eBird, 2026
4/3/2026	8	Pulau Patok, Bruit, Malaysia	Majri, N., Ng, J.J /eBird, 2026
6/3/2026	5	Sankina Aquaculture, Tawau, Malaysia	Shao, S.T. /eBird, 2026

Ni: No information on the number of bird

The discovery of *H. caspia* in Kalimantan, Indonesia, opens a new avenue for investigating whether migratory bird movement patterns through this region involve specific, critical stopover sites, highlighting the need for further observation and research. It is anticipated that delineating the migration patterns of migratory bird taxa in Kalimantan will ultimately facilitate the implementation of effective conservation strategies for both the migratory species and their essential stopover habitats.

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