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Exploring Balochistan Coast as key Sea Bird Sanctuaries: New Records of Avian Fauna

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Abstract
The study documents two new seabird records for Pakistan, *Anous tenuirostris* (Lesser Noddy) and *Sula leucogaster* (Brown Booby) and confirms additional observations of *Sula dactylatra* (Masked Booby) along the Makran coast of Balochistan. Surveys conducted at Astola Island, Juddi Beach (Pasni), and Gurab Island recorded these species as non-resident visitors primarily using the area for foraging. All three recorded species are currently listed as Least Concern (LC) on the IUCN Red List. However, their sporadic presence in Pakistani waters underscores the need for continued monitoring to assess any potential shifts in distribution patterns, possibly related to climate change, marine productivity, or habitat disturbances in the wider Indian Ocean region. Supported by local ecological knowledge, the findings indicate recent seasonal occurrences and potential range extensions into the northern Arabian Sea. The findings highlight the Makran coast as a potentially important seabird sanctuary and emphasize the need for continued monitoring to better assess avian diversity and inform regional conservation planning.

Keywords: Noddy, Booby, New records, Pasni, Gurrab Island.

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INTRODUCTION

The Makran coast of Balochistan, extending along the northern Arabian Sea and the Gulf of Oman, represents one of the least disturbed and biologically rich coastal regions of Pakistan. Characterized by extensive rocky and sandy shorelines, lagoons, and small islands, the area supports diverse marine life under relatively low anthropogenic pressure. Major fishing and coastal settlements such as Jiwani, Pishukan, Gwadar, Surbandar, Pasni, Ormara, and Damb are the principal centers of marine-based economic activities (Shahzad, 2021; Majeed et al., 2021), while much of the remaining coastline remains sparsely inhabited and ecologically intact. The coastal and offshore waters of Balochistan are strongly influenced by the Arabian Sea monsoon system, with distinct southwest and northeast monsoons and two inter-monsoonal periods (Wilson, 2000). These alternating monsoonal regimes promote nutrient enrichment and enhance marine productivity, supporting a rich food web that sustains fish, shellfish, and seabird populations.

Seabirds are among the most visible and ecologically significant components of coastal ecosystems, acting as indicators of marine productivity and environmental quality. Healthy seabird populations reflect intact habitats, whereas declines often signal ecosystem degradation (Ali et al., 2011). The South Asian biogeographical region comprising Afghanistan, Pakistan, India (including the Andaman

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and Nicobar Islands), Nepal, Bhutan, Bangladesh, Sri Lanka, the Maldives, and the Chagos Archipelago represents only a small portion of the Oriental Region. However, it supports about 1,300 bird species, accounting for roughly 13% of the world's avifauna (Rasmussen and Anderton, 2012). Among these, approximately 143 species (11%) are endemic to South Asia, highlighting the region's significance for avian biodiversity conservation.

Pakistan's avifauna currently includes about 805 species (Lepage, 2025). Within Pakistan, about 30% of avian species are long-distance migrants, 43% are Oriental or Palearctic breeders, and 27% are winter visitors (Roberts, 1991). The country lies along a major migratory route known as the Indus Flyway Zone**,** which provides critical stopover and wintering habitats for cranes, ducks, flamingos, geese, swans, and numerous waders (Ali, 2005).

Balochistan's coastal wetlands, including lagoons, mudflats, and offshore islands, are particularly important for these migratory and resident bird populations. Numerous studies have documented avifaunal diversity along this coast, such as Groombridge, (1989), Scott, (1989), Scott and Poole (1989), Ahmed et al., (1992), Khurshid et al., (1995), Ghalib and Hasnain, (1997, 1999), Khurshid and Jabeen, (2000), Arshad et al., (2002), Ghalib et al., (2004, 2006, 2008, 2009, 2019), Pandrani et al., (2005), Hassan and Khan, (2005, 2009), Khan and Ghalib, (2006), Grimmett et al., (2008), Rasool and Hasnain, (2008, 2009), and Siddiqui et al., (2008), Ali et al., (2011), Begum et al., (2016), Gabol et al., (2018), Kanwal et al., (2018).

From Pakistan, the family Sulidae is currently represented by a single genus, *Sula*, with one confirmed species, *Sula dactylatra* (Masked Booby). In contrast, the family Laridae comprising approximately 11 species including the genus *Anous* of which *Anous stolidus* has been documented (del Hoyo et al., 2014). Despite these efforts, large stretches of the Makran coastline remain poorly surveyed. The present study contributes two new avifaunal records: *Anous tenuirostris* (Lesser Noddy) and *Sula leucogaster* (Brown Booby) with the observation of *Sula dactylatra* (Masked Booby) from the Makran coast of Balochistan, northern Arabian Sea. Notably, *A. tenuirostris* has also been observed at Mubarak Village based on a single photographic record, though no further ecological details are available from that site. Detailed notes on their occurrence, habitat associations, global distribution, and conservation status are provided to enhance knowledge of Pakistan's coastal avifauna and support regional conservation initiatives. These findings demonstrate that new avian records continue to emerge from this underexplored region, emphasizing the need for ongoing monitoring to document avian diversity and identify potential seabird sanctuaries.

MATERIAL AND METHODS

Field observations were conducted along the Makran coast of Balochistan, northern Arabian Sea, during routine visits between 2024 and 2025. Observations were made at Juddi Beach, Pasni (25°15′54″N, 63°28′11″E), Astola Island (25°07′20″N, 63°49′42″E), and Guraab Island (25°06′24″N, 63°51′09″E), which is about 1.5 km south of Astola Island (Fig. 1). Three seabird species were documented: Lesser Noddy, *Anous tenuirostris* (Temminck, 1823) was observed at Juddi Beach and later on Astola Island. The Brown Booby, *Sula leucogaster* (Boddaert, 1783) and Masked Booby, *Sula dactylatra* Lesson, 1831 were observed at Guraab Island. Photographs for species identification and counting were taken from a safe distance to avoid disturbance. Species were identified using standard field guides (Grimmett et al., 2008; Rasmussen & Anderton, 2012). Conservation status was obtained from IUCN Red List (2025) and relevant literature. All observations followed ethical, non-invasive field practices.

RESULTS

In the present study, three seabird species were documented: the Lesser Noddy, *Anous tenuirostris* (Temminck, 1823) and the Brown Booby, *Sula leucogaster* (Boddaert, 1783) are reported for the first time from Pakistan, while the Masked Booby, *Sula dactylatra* Lesson, 1831, previously recorded from the country, was also observed during this study.

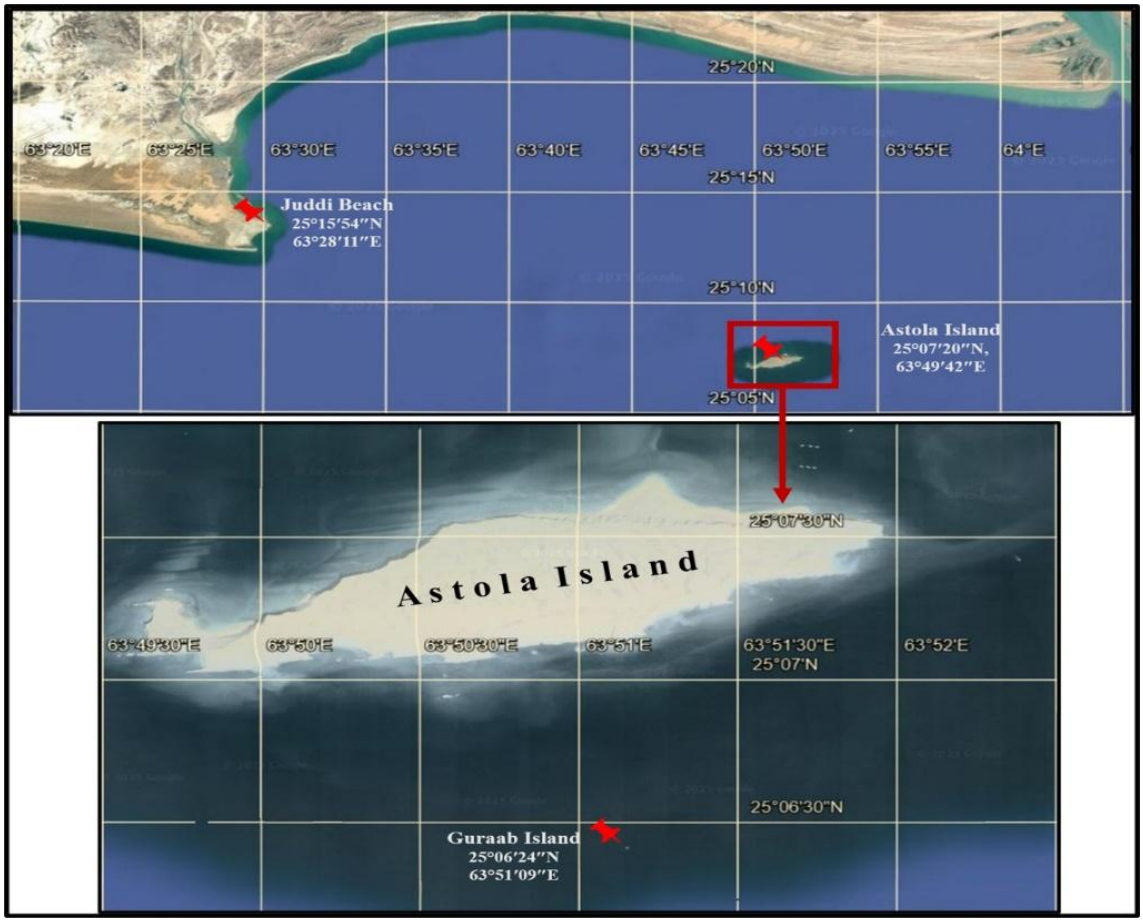

FIGURE 1. Map of study areas, Juddi Beach, Pasni (25°15′54″N, 63°28′11″E), Astola Island (25°07′20″N, 63°49′42″E) and Guraab Island (25°06′24″N, 63°51′09″E).

Family Laridae Vigors, 1825
Genus *Anous* Stephens, 1826
***Anous tenuirostris* (Temminck, 1823)**
Common Name: Lesser Noddy (Fig. 2)

Material examined: Two individuals photographed at Juddi beach, Pasni (25°15′54″N, 63°28′11″E) on 11th August 2024 and Astola island (25°07′20″N, 63°49′42″E) on 16th November 2024.
Description: A small, slender tern-like seabird measuring 28–34 cm in length with a wingspan of 50–61 cm. Plumage dark brown to grayish-black slightly lighter on the tail, and a whitish forehead that merges into a bluish- or lavender-gray crown. Lores softer grayish appearance. Iris brown, bill long, thin, slightly decurved, and black, and the legs and feet brownish-black. Flight is fast, agile, and graceful, often mixing with other terns.
Distribution: Atlantic and Indo-West Pacific: From Belize and north to Oman, south to Madagascar and east to Australia.

Family Sulidae Reichenbach, 1849
Genus *Sula* Brisson, 1760
***Sula leucogaster* (Boddaert, 1783)**
Common Name: Brown Booby (Fig. 3)

FIGURE 2. A, Lesser Noddy on ground. B, side view of Lesser Noddy. C, closer view of *Anous tenuirostris* (Temminck, 1823) with magnification of head recorded at Juddi Beach.

Material examined: Thirty-four individuals photographed at Guraab Island (25°06′24″N, 63°51′09″E), on 16th November 2024, 19th December 2024, 13th January 2025, 26th February 2025, 18th March 2025, 30th August 2025, 10th September 2025.
Description: A medium to large seabird measuring 64–85 cm in length with a wingspan of 135–150 cm. Adults sooty-brown above, including the head, neck, and breast, with a sharply contrasting white belly and undertail coverts. The underwings are mostly white, bordered by dark brown leading and trailing edges and tips. The bill yellow to greenish-gray, often with a pink or bluish tip, and the facial skin ranges from yellow to greenish. Eyes dark brown, and the legs and feet vary from yellowish to greenish-gray.
Distribution: Indo-Pacific and Western Central Atlantic.

Family Sulidae Reichenbach, 1849
Genus *Sula* Brisson, 1760
***Sula dactylatra* Lesson, 1831**
Common Name: Masked Booby (Fig. 3)

Material examined: Seventy-four individuals photographed at Guraab Island (25°06′24″N, 63°51′09″E), on 16th November 2024, 19th December 2024, 13th January 2025, 26th February 2025, 18th March 2025, 30th August 2025, 10th September 2025.
Description: A large white seabird measuring 74–86 cm in length with a wingspan of about 152 cm. Neck long, slender pointed wings, and a tapered wedge-shaped black tail. Adults with pure white plumage, black flight feathers along the wing edges. A distinct dark facial mask surrounds the eyes and base of the stout yellow bill. The eyes yellow, and the legs and feet range from olive to yellowish-gray. Juveniles gray-brown above with pale mottled underparts and a blue-green tinge to the bill. Its dark facial mask, black wings and tail, and large body size distinguish it from other boobies.
Distribution: Indo-Pacific, Atlantic Ocean and the Mediterranean Sea.

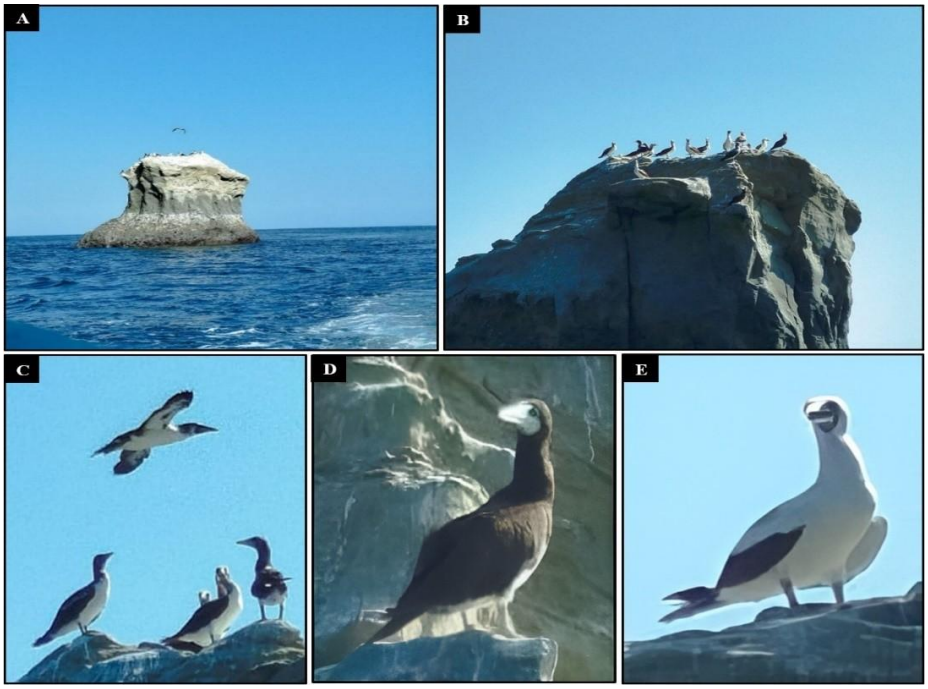

FIGURE 3. A, Guraab Island. B-C, Brown and Masked Boobies. D, Brown Bobby *Sula leucogaster* (Boddaert, 1783). E, Masked Booby, *Sula dactylatra* Lesson, 1831.

DISCUSSION

The present study provides new insights on the occurrence of three seabird species *Anous tenuirostris* (Lesser Noddy), *Sula leucogaster* (Brown Booby), and *Sula dactylatra* (Masked Booby) along the Makran coast of Balochistan, including Astola Island, Juddi Beach (Pasni), and Gurab Island. Field records and local knowledge confirm that these species are non-resident visitors, using these sites mainly for foraging activities rather than for breeding. Among these, *A. tenuirostris* (Lesser Noddy) and *S. leucogaster* (Brown Booby) represent the first confirmed records from Pakistan, while *S. dactylatra* (Masked Booby) has been previously reported from the region. Notably, *A. tenuirostris* has also been observed at Mubarak Village based on a single photographic record, though no further ecological details are available from that site.

From a biogeographical perspective, all three species are widely distributed tropical seabirds. The Lesser Noddy (*Anous tenuirostris*) is known to breed on coral atolls and mangrove islets across the Indian Ocean, including the Seychelles, Chagos Archipelago, and Maldives (Gochfeld et al., 2020; Harrison et al., 2021). Its presence at Juddi Beach and Astola Island, without evidence of nesting, indicates a range extension for feeding activity into the northern Arabian Sea. Similarly, the Brown Booby (*Sula leucogaster*) is distributed across the Atlantic, Indian, and Pacific Oceans, breeding extensively in regions such as the Caribbean, the Red Sea, northern Australia, and several oceanic islands (Nelson, 2005; BirdLife International, 2021). Its detection along the Balochistan coast represents the northernmost edge of its range in the Arabian Sea. The Masked Booby (*Sula dactylatra*), on the other hand, has one of the widest distributions among tropical seabirds, being recorded from nearly every ocean except the eastern Atlantic, northern Indian Ocean, and central-eastern Pacific (del Hoyo et al., 1992).

According to local fishermen, who have lived and fished around Astola Island since 2013, these species were observed for the first time in this region during the 2024 season. According to local reports that these birds visited temporarily for feeding with no evidence of nesting. Local fishermen's long-term familiarity with the area adds credibility to the assertion that these are newly recorded or infrequently sighted seabirds in the coastal waters of Balochistan. This aligns with the lack of previous data or published reports on their occurrence in Pakistan's offshore islands, indicating that the current findings

TABLE 1. Monthly counts of three bird species (*Anous tenuirostris*, *Sula leucogaster*, and *Sula dactylatra*) observed at Juddi Beach, Astola island and Guraab Island of the Makran region between August 2024 and September 2025. Dash (–) indicates no individuals recorded.

S.No.	Species Name	Aug 2024	Nov 2024	Dec 2024	Jan 2025	Feb 2025	Mar 2025	Aug 2025	Sep 2025	Total	IUCN Status
1	*Anous tenuirostris* (Lesser Noddy)	1	1	-	-	-	-	-	-	2	Least Concern (Stable)
2	*Sula leucogaster* (Brown bobby)	-	7	2	3	2	5	9	6	34	Least Concern (Decreasing)
3	*Sula dactylatra* (Masked bobby)	-	14	12	8	8	6	15	11	74	Least Concern (Decreasing)

represent first records of seasonal visitation for these species. Local fishermen further reported that, despite the regular presence of many seabird species around Astola Island and the adjacent areas, only the Sooty Gull is known to breed there. This indicates that while Astola Island serves as a critical foraging ground, it does not function as a major breeding habitat for most seabirds.

The monthly abundance data (Table 1) show that *S. dactylatra* (Masked Booby) was the most abundant species, with 74 individuals observed, followed by *S. leucogaster* (Brown Booby) with 34 individuals, and *A. tenuirostris* (Lesser Noddy) recorded only twice during the study period. The relatively high numbers of Masked Boobies compared to Brown Boobies suggest that Masked Boobies are the dominant visiting species around Gurab island. Behavioral differences were also observed, with Masked Boobies being more active and agile divers than Brown Boobies which indicates that its occurrence is closely linked with abundant fish availability including small pelagic species, cuttlefish, and groupers known to inhabit the reef and offshore areas of Astola Island.

In terms of conservation status, all three recorded species are currently listed as Least Concern (LC) on the IUCN Red List, (2025) However, their sporadic presence in Pakistani waters underscores the need for continued monitoring to assess any potential shifts in distribution patterns, possibly related to climate change, marine productivity, or habitat disturbances in the wider Indian Ocean region.

The integration of local ecological knowledge, particularly from experienced fishermen has proven crucial in documenting these first sightings. Such collaboration bridges scientific and traditional knowledge systems and enhances the accuracy of biodiversity assessments in remote coastal and island habitats.

CONCLUSION

Overall, the findings suggest that Astola Island and the surrounding waters of the Makran coast play an emerging role as important seasonal feeding sites for tropical seabirds extending into the northern Arabian Sea. Future work should focus on systematic seabird surveys, prey abundance assessments, and environmental monitoring to better understand the ecological drivers behind these newly recorded occurrences and to support conservation planning for Pakistan's offshore islands.

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LITERATURE CITED

Ahmed, M.F., Ghalib, S.A., Hasnain, S.A., 1992. The waterfowl of the Makran Coast. Proc. Nat. Conf. Problems and Resources of Makran Coast and Plan of Action for its Development. Pakistan Council for Science and Technology, Islamabad, pp. 113–123.

Ali, Z., Bibi, F., Shelly, S.Y., Qazi, A., Khan, A.M., 2011. Comparative avian faunal diversity of Jiwani coastal wetlands and Taunsa Barrage Wildlife Sanctuary, Pakistan. *Journal of Animal and Plant Sciences* 21(2), 381–387.

Arshad, M., Ali, Z., Mahmood, H., Muzaffar, M., 2002. Makran Coastal Wetland Complex: A Preliminary Biological Assessment. Unpublished Report.

Begum, A., Khan, M.Z., Ghalib, S.A., Kanwal, R., Zehra, A., Yasmeen, G., Safi, A., 2016. Distribution, status and current trends in the population of coastal birds of Balochistan. *Canadian Journal of Pure and Applied Sciences* 10, 3853–3864.

BirdLife International, 2021. Species factsheet: *Sula leucogaster*. http://www.birdlife.org (accessed 22 December 2021).

Del Hoyo, J., Collar, N.J., Christie, D.A., Elliott, A., Fishpool, L.D.C., 2014. HBW and BirdLife International Illustrated Checklist of the Birds of the World, vol. 1. Lynx Edicions & BirdLife International, Barcelona.

Gabol, K., Ahmed, W., Rahim, A., Shams, Z.I., Ahmed, Z., Batool, A., 2018. Status and diversity of coastal avian fauna in Gwadar peninsula, Balochistan. *Pakistan Journal of Marine Sciences* 27(2), 121–131.

Ghalib, S.A., Hasnain, S.A., 1997. Avifauna of the Mangroves of Balochistan Coast. In: Mufti, S.A., Woods, C.A., Hasan, S.A. (Eds.), Biodiversity of Pakistan. *Pakistan Museum of Natural History* Islamabad & Florida Museum of Natural History, Florida, pp. 423–428.

Ghalib, S.A., Husnain, S.A., 1999. The wetlands of Balochistan. *Wildlife and Environment* 8(1), 23–25.

Ghalib, S.A., Khan, A.R., Zehra, A., 2004. Current status of the birds of Balochistan. *Journal of Natural History and Wildlife* 3(2), 51–62.

Ghalib, S.A., Khan, A.R., Abbas, D., 2006. An overview of the Asian Waterbirds Census in Pakistan. *Journal of Natural History and Wildlife* 5(1), 181–189.

Ghalib, S.A., Jabbar, A., Wind, J., Zehra, A., Abbass, D., 2008. Avifauna of Hingol National Park, Balochistan. *Pakistan Journal of Zoology* 40(5), 317–330.

Ghalib, S.A., Rais, M., Abbas, D., Tabbassum, F., Begum, A., Jabeen, T., 2009. An overview of the status of shorebirds and internationally important sites in Pakistan. *Pakistan Journal of Zoology* 41(3), 165–172.

Ghalib, S.A., Khan, M.Z., Kanwal, R., Zehra, A., Siddiqui, S., Abbas, D., Yasmeen, G., Hussain, B., Khan, A.R., 2019. Recent observations on the distribution and status of wildlife of Balochistan. *Canadian Journal of Pure and Applied Sciences* 13(2), 4813–4846.

Gochfeld, M., Burger, J., Garcia, E.F.J., 2020. Lesser Noddy (*Anous tenuirostris*), version 1.0. In: del Hoyo, J., Elliott, A., Sargatal, J., Christie, D.A., de Juana, E. (Eds.), Birds of the World. Cornell Lab of Ornithology, Ithaca.

Grimmett, R., Roberts, T., Inskipp, T., 2008. Birds of Pakistan. Christopher Helm, London.

Groombridge, B., 1989. Marine Turtle in Balochistan: Report on Aerial Survey, 9–11 September 1988 with Notes on Wetland Sites and a Proposed Marine Turtle Conservation Project. World Conservation Monitoring Centre, Cambridge.

Harrison, P., Perrow, M.R., Larsson, H., 2021. Seabirds: The New Identification Guide. Lynx Edicions, Barcelona, 600 pp.

Hasan, A., Khan, S.A., 2005. Some observations on the vertebrate fauna of Jiwani wetland complex. *Records Zoological Survey of Pakistan* 16, 12–25.

Hasan, A., Khan, A., 2009. Birds diversity at Makran Coastal Wetland Complex. Proc. Seminar on Trans-boundary Coastal and Marine Protected Areas with Special Priorities for Spawning Grounds. Zoological Survey Department, Government of Pakistan, pp. 42–48.

IUCN, 2025. The IUCN Red List of Threatened Species. Version 2025-2. https://www.iucnredlist.org

Kanwal, R., Ullah, U., Hussain, B., Yasmeen, G., Zehra, A., Siddiqui, S., Raza, N., Imdad, U., Hussain, S.E., Khan, A.R., Ghalib, S.A., 2018. First Marine Protected Area of Pakistan: Astola Island. *Canadian Journal of Pure and Applied Sciences* 12(1), 4423–4432.

Khan, M.Z., Ghalib, S.A., 2006. Marine Ramsar sites in Pakistan with reference to the biodiversity of Astola Island and Jiwani coastal wetland. *Journal of Natural History and Wildlife* 5(1), 165–168.

Khurshid, S.N., Azam, M.M., Hasnain, S.A., Rasool, F., 1995. Astola Island: A potential site for Marine National Park. WWF Pakistan, unpublished report, 15 pp.

Khurshid, S.N., Jabeen, R., 2000. Astola Island. *Natura* 27(1), 7–8.

Lepage, D., 2025. Checklist of Birds of Pakistan. Bird Checklists of the World. Avibase. https://avibase.bsc-eoc.org/checklist.jsp?region=PK

Majeed, A., Liang, Z., Zhu, L., Liu, C., Kalhoro, M.A., Saeed, F., 2021. Stock analysis of shrimp scad (*Alepes djedaba*) fishery from northern Arabian Sea, Balochistan coast, Pakistan. *Pakistan Journal of Zoology* 54(5).

Nelson, B., 2005. Pelecaniformes: Pelicans, Cormorants and Their Relatives. Oxford University Press, Oxford. https://doi.org/10.1093/oso/9780198577270.001.0001

Pandrani, A., Hasnain, S.A., Ghalib, S.A., Ahmed, E., 2005. Observation on the waterbirds of Jiwani wetland complex, Makran coast (Balochistan). *Pakistan Journal of Zoology* 37, 301–306.

Rasool, F., Hasnain, S.A., 2008. Observation on the avifauna of Miani Hor, Balochistan. *Pakistan Journal of Marine Sciences* 17(2), 99–106.

Rasool, F., Hasnain, S.A., 2009. Gwadar Bay: A potential site for trans-boundary marine protected area between Iran and Pakistan. Proc. Seminar on Trans-boundary Coastal and Marine Protected Areas with Special Priorities for Spawning Grounds. Zoological Survey Department, Government of Pakistan, pp. 14–27.

Rasmussen, P.C., Anderton, J., 2012. Birds of South Asia: The Ripley Guide, second ed., 2 vols. Smithsonian Institution, Washington D.C. & Lynx Edicions, Barcelona. 684 pp.

Roberts, T.J., 1991. The Birds of Pakistan, 2 vols. Oxford University Press, Karachi.

Scott, D.A. (Ed.), 1989. A Directory of Asian Wetlands. IUCN, Gland, Switzerland, pp. 360–361.

Scott, D.A., 1989. A Directory of Asian Wetlands. International Council for Bird Preservation, 1181 pp.

Scott, D.A., Poole, C.M., 1989. A status overview of Asian wetlands, based on *A Directory of Asian Wetlands*. Asian Wetland Bureau, Malaysia.

Shahzad, S.M., 2021. Economic prosperity through Pakistan marine fishery: Opportunities and challenges. *Pakistan Journal of Multidisciplinary Research* 2(1), 39–57.

Siddiqui, P.J.A., Farooq, S., Shafique, S., Burhan, Z., Farooqi, Z., 2008. Conservation and management of biodiversity in Pakistan through the establishment of Marine Protected Areas. *Ocean & Coastal Management* 51, 377–382.

Wilson, S.C., 2000. Northwest Arabian Sea and Gulf of Oman. In: Sheppard, C. (Ed.), Seas at the Millennium: An Environmental Evaluation. Pergamon Press, Amsterdam.