19. Marine Birds of India: An Overview

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India's extensive coastline, encompassing diverse habitats like sandy beaches, mudflats, and mangroves, supports a rich avifauna of coastal and shorebirds. These avian species exhibit specialized adaptations for foraging and survival in dynamic intertidal zones.

Shorebirds, also known as waders, are a diverse group of long-legged avian species inhabiting wetland and coastal environments, distinct from web-footed seabirds. Their elongated legs are a key adaptation, enabling them to wade through mud and shallow water, foraging for small invertebrates. These invertebrates are detected using sensitive nerve endings concentrated at the tips of their characteristically long, narrow bills. The variation in bill length among shorebird species facilitates resource partitioning within shared habitats, minimizing direct competition for food. They probe beach and mudflat substrates for invertebrates, crustaceans, and small fish. A significant proportion of shorebird species exhibit migratory behaviour, undertaking long journeys for breeding and in response to seasonal changes. Shorebirds of India primarily belong to the families Charadriidae and Scolopacidae.

Coastal birds, a broader group, include species that frequent coastal habitats for feeding or breeding. These may include seabirds, waders, and even some terrestrial birds that have adapted to coastal environments. Herons (Ardea spp.) and egrets (Egretta spp.) stalk prey in shallow waters and along shorelines. India's coastal avifauna also includes several resident and migratory waterfowl species, such as ducks, geese, and flamingos, which utilize coastal wetlands and estuaries. These birds contribute to the ecological balance of coastal ecosystems by regulating prey populations and nutrient cycling.

List of coastal and shorebirds of India:

	Nomenclature	**Family**	**Conservation Status**	**Resident/ Migrant**
Order Accipitriformes				
1	Brahminy kite *Haliastur indus*	Accipitridae	Least Concern (LC)	Resident
2	White-bellied sea eagle *Ichthyophaga leucogaster*	Accipitridae	LC	Resident

Order Charadriiformes				
3	Siberian Sand Plover *Anarhynchus mongolus*	Charadriidae	LC	Winter visitor
4	Greater Sand Plover *Charadrius leschenaultii*	Charadriidae	LC	Winter visitor
5	Little Ringed Plover *Charadrius dubius*	Charadriidae	LC	Resident/Locally Migrant
6	Kentish Plover *Charadrius alexandrinus*	Charadriidae	LC	Winter visitor
7	Pacific Golden Plover *Pluvialis fulva*	Charadriidae	LC	Winter visitor
8	Common Ringed Plover *Charadrius hiaticula*	Charadriidae	LC	Winter visitor
9	Grey Plover *Pluvialis squatarola*	Charadriidae	LC	Winter visitor
10	Red-wattled Lapwing *Vanellus indicus*	Charadriidae	LC	Resident
11	Yellow-wattled Lapwing *Vanellus malabaricus*	Charadriidae	LC	Resident
12	Common Snipe *Gallinago gallinago*	Scolopacidae	LC	Winter visitor
13	Black-tailed Godwit *Limosa limosa*	Scolopacidae	Near Threatened (NT)	Winter visitor
14	Bar-tailed Godwit *Limosa lapponica*	Scolopacidae	NT	Winter visitor
15	Whimbrel *Numenius phaeopus*	Scolopacidae	LC	Winter visitor
16	Eurasian Curlew *Numenius arquata*	Scolopacidae	NT	Winter visitor
17	Spotted Redshank *Tringa erythropus*	Scolopacidae	LC	Winter visitor
18	Common Redshank *Tringa totanus*	Scolopacidae	LC	Winter visitor

19	Marsh Sandpiper *Tringa stagnatilis*	Scolopacidae	LC	Winter visitor
20	Common Greenshank *Tringa nebularia*	Scolopacidae	LC	Winter visitor
21	Green Sandpiper *Tringa ochropus*	Scolopacidae	LC	Winter visitor
22	Wood Sandpiper *Tringa glareola*	Scolopacidae	LC	Winter visitor
23	Common Sandpiper *Actitis hypoleucos*	Scolopacidae	LC	Winter visitor
24	Terek Sandpiper *Xenus cinereus*	Scolopacidae	LC	Winter visitor
25	Ruddy Turnstone *Arenaria interpres*	Scolopacidae	NT	Winter visitor
26	Great Knot/ Eastern Knot *Calidris tenuirostris*	Scolopacidae	Endangered (EN)	Winter visitor
27	Sanderling *Calidris alba*	Scolopacidae	LC	Winter visitor
28	Little Stint *Calidris minuta*	Scolopacidae	LC	Winter visitor
29	Temminck's Stint *Calidris temminckii*	Scolopacidae	LC	Winter visitor
30	Dunlin *Calidris alpina*	Scolopacidae	LC	Winter visitor
31	Curlew Sandpiper *Calidris ferruginea*	Scolopacidae	Near Threatened (NT)	Winter visitor
32	Broad-billed Sandpiper *Limicola falcinellus*	Scolopacidae	LC	Winter visitor
33	Ruff *Philomachus pugnax*	Scolopacidae	NT	Winter visitor
34	Buff-breasted Sandpiper *Calidris subruficollis*	Scolopacidae	Vulnerable (VU)	Winter visitor
35	Asian Dowitcher *Limnodromus semipalmatus*	Scolopacidae	NT	Winter visitor

36	Red Knot *Calidris canutus*	Scolopacidae	NT	Winter visitor
37	Greater painted-snipe *Rostratula benghalensis*	Rostratulidae	LC	Resident/Local Migrant
38	Eurasian Oystercatcher *Haematopus ostralegus*	Haematopodidae	NT	Vagrant
39	Great Thick-knee *Esacus recurvirostris*	Burhinidae	NT	Resident/Local Migrant
40	Crab Plover *Dromas ardeola*	Dromadidae	LC	Vagrant
41	Swallow Plover/Small Pratincole *Glareola lactea*	Glareolide	LC	Resident/Local Migrant
42	Oriental Pratincole *Glareola maldivarum*	Glareolide	LC	Local Migrant/Resident
43	Black-winged Stilt *Himantopus himantopus*	Recurvirostridae	LC	Local Migrant
44	Pied Avocet *Recurvirostra avosetta*	Recurvirostridae	LC	Vagrant
Order Passeriformes				
45	Barn swallow *Hirundo rustica*	Hirundinidae	LC	Winter visitor
Order Suliformes				
46	Little cormorant *Microcarbo niger*	Phalacrocoracidae	LC	Resident
47	Indian cormorant *Phalacrocorax fuscicollis*	Phalacrocoracidae	LC	Resident
48	Great cormorant *Phalacrocorax carbo*	Phalacrocoracidae	LC	Resident
Order Pelecaniformes				
49	Indian pond heron *Ardeola grayii*	Ardeidae	LC	Resident
50	Intermediate egret *Mesophoyx intermedia*	Ardeidae	LC	Resident
51	Little egret	Ardeidae	LC	Resident

	Egretta garzetta			
52	Eastern cattle egret *Egretta coromanda*	Ardeidae	LC	Resident
53	Western reef heron *Egretta gularis*	Ardeidae	LC	Resident
54	Great egret *Ardea alba*	Ardeidae	LC	Resident

Pelagic birds: India's diverse coastline and varied marine habitats support a rich seabird diversity, attracting species from both Northern and Southern hemispheres. Four factors attract seabirds to Indian waters: migration from breeding grounds to warmer climates, post-breeding dispersal from nearby areas, wind-driven movements to productive western Indian waters (especially during the monsoon), and the arrival of vagrant/nomadic species due to individual behaviours. These factors combine seasonal migration, regional dispersal, opportunistic foraging, and individual movements. Observations across Kerala and Lakshadweep reveal that seabird distribution correlates with high pelagic productivity, particularly during the monsoon when upwelling creates abundant foraging opportunities. These birds primarily target small fish and shrimp in inshore waters, with minimal interaction with local fisheries, benefiting further from the annual trawl ban. India's waters host migratory seabirds year-round. Southern hemisphere species like Wilson's storm petrels and Flesh-footed shearwaters arrive April-May, while Arctic breeders (jaegers) appear during northern hemisphere autumn migration. Increased sightings suggest India's coastal waters are crucial for these migrants. Vagrant species (Tropical, Sooty, Cory's shearwaters, Black-bellied storm petrel, Light-mantled albatross) appear erratically, often wind-driven, particularly during monsoons. Similarly, frigatebirds and Masked boobies are occasionally wind-blown to Indian coasts. Jaegers migrating eastward past Sri Lanka likely originate from western Indian waters, though their return route remains unclear. Monsoon winds create upwelling off western India, attracting numerous tern species (Saunders, Lesser/Great crested, Bridled, Sooty, Common, Lesser/Brown noddy, Little, Caspian). These terns, many breeding in nearby islands (Lakshadweep, Maldives, Chagos, Sri Lanka), are likely wind-driven to Indian shores. Sooty and Brown noddy terns breed in Lakshadweep, with Sooty terns possibly breeding earlier in the monsoon or migrating elsewhere post-breeding. Lesser noddies, breeding in Chagos/Seychelles, appear along India's west coast during the monsoon, likely a post-breeding dispersal. Saunders terns, breeding in the western Indian Ocean, frequent Indian inshore waters during the monsoon, possibly originating from Chagos/Seychelles. Citizen science initiatives, including organized "Sea watching" events, have significantly enhanced seabird monitoring efforts, leading to increased records and the discovery of rare species like the Arctic tern, Christmas Island frigatebird, and Red-footed booby.

Pelagic birds of India:

SI. No	Scientific Name	Common name	Family	IUCN Status
Order Laridae				
1	*Larus hemprichii* Bruch, 1853	Sooty Gull	Laridae	LC
2	*Larus canus* Linnaeus, 1758	Mew Gull	Laridae	LC
3	*Larus fuscus heuglini* Bree, 1876	Heuglin's Gull	Laridae	LC
4	*Larus cachinnans* Pallas, 1811	Caspian Gull	Laridae	LC
5	*Larus fuscus* Linnaeus, 1758	Lesser Black-backed Gull	Laridae	LC
6	*Larus ichthyaetus* Pallas, 1773	Great Black-headed Gull	Laridae	LC
7	*Larus brunnicephalus* Jerdon, 1840	Brown-headed Gull	Laridae	LC
8	*Larus ridibundus* Linnaeus, 1766	Black-headed Gull	Laridae	LC
9	*Larus genei* Brème, 1839	Slender-billed Gull	Laridae	LC
10	*Larus relictus* Lönnberg, 1931	Relict Gull	Laridae	VU
11	*Hydrocoloeus minutus* (Pallas, 1776)	Little Gull	Laridae	LC
12	*Gelochelidon nilotica* (Gmelin, 1789)	Gull-billed Tern	Laridae	LC
13	*Hydroprogne caspia* (Pallas, 1770)	Caspian Tern	Laridae	LC
14	*Thalasseus bengalensis* *Sterna bengalensis* Lesson, 1831 (Accepted name)	Lesser Crested Tern	Laridae	LC
15	*Sterna bergii* Lichtenstein, 1823	Greater Crested Tern	Laridae	LC
16	*Sterna dougallii* Montagu, 1813	Roseate Tern	Laridae	LC
17	*Sterna hirundo* Linnaeus, 1758	Common Tern	Laridae	LC
18	*Sternula albifrons* (Pallas, 1764)	Little Tern	Laridae	LC

19	*Sternula saundersi* (Hume, 1877)	Saunders's Tern	Laridae	LC
20	*Thalasseus sandvicensis* *Sterna sandvicensis* Latham, 1787 (Accepted name)	Sandwich Tern	Laridae	LC
21	*Sterna repressa* Hartert, 1916	White-cheeked Tern	Laridae	LC
22	*Chlidonias hybrida* (Pallas, 1811)	Whiskered Tern	Laridae	LC
23	*Chlidonias leucopterus* (Temminck, 1815)	White-winged Tern	Laridae	LC
24	*Rynchops albicollis* Swainson, 1838	Indian Skimmer	Rynchopidae	VU
25	*Ichthyaetus ichthyaetus*	Pallas Gull	Laridae	LC
26	*Lanus canus*	Common Gull	Laridae	LC
27	*Larus argentatus*	Herring Gull	Laridae	LC
28	*Ichthyaetus leucophthalmus*	White-eyed Gull	Laridae	LC
29	*Xema sabini*	Sabine’s Gull	Laridae	LC
30	*Leucophaeus pipixcan*	Franklin’s Gull	Laridae	LC
31	*Onychoprion anaethetus*	Bridled Tern	Laridae	LC
32	*Anous stolidus*	Brown Noddy	Laridae	LC
33	*Anous minutus*	Black Noddy	Laridae	LC
34	*Anous tenuirostris*	Lesser Noddy	Laridae	LC
Order Procellariiformes				
35	*Ardenna grisea*	Sooty Shearwater	Procellariidae	NT
36	*Puffinus carneipes*	Flesh-footed Shearwater	Procellariidae	NT
37	*Puffinus persicus*	Persian Shearwater	Procellariidae	LC
38	*Ardenna pacifica*	Wedge-tailed Shearwater	Procellariidae	LC

39	*Calonectris leucomelas*	Streaked Shearwater	Procellariidae	NT
40	*Puffinus tenuirostris*	Short-tailed Shearwater	Procellariidae	LC
41	*Puffinus bailloni*	Tropical Shearwater	Procellariidae	LC
42	*Calonectris borealis*	Cory’s Shearwater	Procellariidae	LC
43	*Bulweria fallax*	Jouanin's Petrel	Procellariidae	NT
44	*Pterodroma baraui*	Barau's Petrel	Procellariidae	EN
45	*Daption capense*	Cape Petrel	Procellariidae	LC
46	*Oceanodroma monorhis*	Swinhoe's Storm-Petrel	Hydrobatidae	NT
47	*Phoebetria palpebrata*	Light-mantled Albatross	Diomedeidae	NT
48	*Pelagodroma marina*	White-faced Storm-Petrel	Oceanitidae	LC
49	*Fregetta tropica*	Black-bellied Storm-Petrel	Oceanitidae	LC
50	*Oceanites oceanicus*	Wilson's Storm-Petrel	Oceanitidae	LC
Order Phaethontiformes				
51	*Phaethon aethereus*	Red-billed Tropicbird	Phaethontidae	LC
52	*Phaethon rubricauda*	Red-tailed Tropicbird	Phaethontidae	LC
53	*Phaethon lepturus*	White-tailed Tropicbird	Phaethontidae	LC
Order Suliformes				
54	*Sula dactylatra*	Masked Booby	Sulidae	LC
55	*Sula sula*	Red-footed Booby	Sulidae	LC
56	*Sula leucogaster*	Brown Booby	Sulidae	LC

57	*Fregata andrewsi*	Christmas Frigatebird	Fregatidae	VU
58	*Fregata minor*	Great Frigatebird	Fregatidae	LC
59	*Fregata ariel*	Lesser Frigatebird	Fregatidae	LC

Threats and conservation:

Conservation efforts are crucial for safeguarding India's coastal and shorebirds, which face increasing pressure from habitat loss, pollution, and climate change. Understanding their ecological roles and migratory patterns is essential for developing effective conservation management strategies. Already a very marked decline in global populations of shorebirds is evident. The International Union for Conservation of Nature (IUCN) has reclassified several shorebird species to higher threat categories, indicating an increased risk of extinction. Migratory shorebirds are particularly vulnerable due to their reliance on specific habitats along their migration routes. Loss or degradation of these stopover sites can have severe consequences for entire populations.

Marine birds face a multitude of threats that jeopardize their populations and the health of marine ecosystems. These threats can be broadly categorized into those stemming from human activities and those exacerbated by climate change.

Human-Induced Threats:

- **Bycatch:** One of the most significant threats is bycatch, where seabirds are unintentionally caught in fishing nets and lines. This results in injury or death, particularly affecting species that forage near fishing vessels. In Lakshadweep, a mutually beneficial relationship exists between seabirds and tuna fishers. Fishers utilize seabird feeding activity as a reliable cue to locate tuna shoals, increasing efficiency and saving time in their pole-and-line fishery. While seabirds and fishers often target the same prey (small pelagic fish, plankton feeders), direct competition and bycatch are potential negative interactions. Globally, gillnets and longlines are major bycatch sources, but this is undocumented in India's tuna fishery. Further research using advanced technologies is needed to accurately assess seabird bycatch in Indian waters.
- **Habitat Loss and Degradation:** Coastal development, pollution, and resource extraction lead to the destruction and degradation of crucial breeding and foraging habitats for marine birds.
- **Pollution:** Marine birds are vulnerable to various forms of pollution. Oil spills can coat their feathers, impairing their ability to fly and regulate body temperature. Plastic pollution is a growing concern, as birds may ingest plastic debris, mistaking it for food, leading to internal injuries and starvation. Chemical pollutants can accumulate in their bodies, affecting their reproductive success and overall health.

- **Invasive Species:** Introduced predators, such as rats and cats, can decimate seabird colonies by preying on eggs and chicks. Invasive plants can also alter nesting habitats, making them unsuitable for breeding.
- **Disturbance:** Human activities, such as tourism and recreation, can disturb breeding colonies, causing birds to abandon their nests and leaving eggs and chicks vulnerable to predators or the elements.

Climate Change-Related Threats:

- **Changes in Prey Availability:** Climate change is altering ocean currents and temperatures, impacting the distribution and abundance of prey species. This can lead to food shortages for marine birds, affecting their survival and reproductive success.
- **Extreme Weather Events:** More frequent and intense storms can destroy nests, displace birds, and reduce their ability to forage effectively.
- **Sea Level Rise:** Rising sea levels can inundate nesting sites, particularly for species that breed on low-lying islands or coastlines.
- **Ocean Acidification:** Increased carbon dioxide levels in the atmosphere are causing the oceans to become more acidic, which can affect the availability of calcium carbonate needed by some marine organisms, including the prey of marine birds.

Recent Threats:

- **Offshore Wind Farms:** The increasing development of offshore wind farms poses a new threat to marine birds, as they may collide with turbines or be displaced from their foraging areas.
- **Plastic Accumulation:** The accumulation of plastic in the oceans continues to rise, posing an ongoing and increasing threat to marine birds. Microplastics, in particular, are a concern, as they can be ingested by birds and their prey, potentially leading to long-term health effects. Seabirds also ingest macroplastics while foraging leading to widespread deaths through obstruction of digestive tracts.
- **Highly Pathogenic Avian Influenza (HPAI) H5N1 outbreak:** This fast spreading viral disease has had a devastating impact on wild animal populations including seabirds globally. Since 2021, this strain of bird flu has led to mass mortality events in numerous seabird colonies, affecting a wide range of species. Seabirds, particularly those nesting in dense colonies, are highly susceptible to the rapid spread of the virus. The close proximity of individuals facilitates transmission, leading to significant population declines. Species like gannets, skuas, and terns have experienced substantial losses, with some colonies facing near-total collapse. The added pressure of widespread mortality events in addition to other threats could lead to long-term population declines and even local extinctions.

The impact of above threats extends beyond seabirds themselves. Changes in seabird populations can disrupt marine ecosystems, affecting food webs and nutrient cycling. The

loss of these birds can also have economic consequences for communities that rely on seabird-related tourism or fishing industries. Addressing this crisis requires a multi-pronged approach, including increased surveillance and conservation efforts to protect remaining populations with steps such as implementing sustainable fishing practices to reduce bycatch, protecting and restoring critical marine habitats, reducing pollution and promoting responsible waste management, controlling invasive species, mitigating the impacts of climate change, developing strategies to minimize the impacts of offshore wind farms and other emerging threats.

Conservation efforts must also consider the interconnectedness of marine ecosystems and the need for international cooperation to protect migratory species that cross national boundaries and for protecting flyways. By understanding and addressing these threats through dedicated research and advocacy, we can help ensure the long-term survival of marine birds and the health of the oceans they inhabit.