

Flyways and Migratory Birds of India

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FLYWAYS, in simple terms, can be called ‘routes’ – migratory routes used by a large population of different species of birds covering a large geographic area. Birds that migrate from the same geographic region often follow broadly well-defined routes known as migratory flyways.

There are eight recognized shorebird flyways around the world. The Asia-Pacific region, as defined by the main migratory routes of waterbirds, is made up of three shorebird flyways – the Central Asian Flyway, the East Asian-Australasian Flyway and the Western (or Central) Pacific Flyway – crossing 57 countries and territories in the region.

The East Asian-Australasian Flyway is the best studied and stretches from Siberia and Alaska southwards through east and south-east Asia to Australia and New Zealand and supports the migration of over five million migratory shorebirds every year. The Central Asian flyway spans about 30 countries from the Arctic to the Indian Ocean. But these flyways are just generalizations and bird populations have been known not to strictly follow them. During migration, birds depend on strategically located staging areas where they stop to rest and “refuel”, building up fat deposits before continuing their migration.

These migratory routes start from the breeding sites to non-breeding sites, which are otherwise called ‘wintering’ sites. India falls in three flyway zones – Central Asian Flyway (CAF), East-Asian Australasian Flyway (EAAF) (covering parts of eastern India) and Asian East African Flyway (AEF) (covering parts of western India).

About 370 species of migratory birds are known to use these flyways, of which the Central Asian Flyway covers at least 274 migratory waterbird populations. These populations comprise 175 species, including 26 globally threatened and near-threatened species that breed, migrate and spend the non-breeding (winter period) within the region. Species such as the critically endangered Sociable Lapwing *Vanellus gregarius*, vulnerable Black-necked Crane *Grus nigricollis*, Indian Skimmer *Rynchops albicollis*, and Bar-headed Goose *Anser indicus*, Ibisbill *Ibidorhyncha struthersii* and Brown-headed Gull *Larus brunnicephalus* are largely restricted to the Central Asian Flyway region.

Meanwhile, the breeding range of some species including the critically endangered Siberian Crane *Grus leucogeranus*, Slender-billed Curlew *Numenius tenuirostris*, endangered Spoon-billed Sandpiper *Eurynorhynchus pygmaeus*, near-threatened Spot-billed Pelican *Pelecanus philippensis* and Relict Gull *Larus relictus*, and Black-winged Pratincole *Glareola nordmanni*, Caspian Plover *Charadrius asiaticus* and Asian Dowitcher *Limnodromus semipalmatus* are largely restricted to the region although the non-breeding ranges overlap with adjoining flyways.

Migration is the regular, recurrent, cyclical seasonal movement of populations from one geographic location to another. It is marked by the eventual return to the original place of departure. Migration is most evident among birds that usually follow a yearly cycle of migration. In some cases, this migration is obvious and involves huge distances but at other times it is much more subtle.

Birds migrate for many reasons including the need to travel to areas where food resources are at their peak abundance, the climate is milder and there is less competition for safe nesting places. But the main environmental trigger for bird migration seems to be the changing ratio of daylight and darkness. With the onset of winter, days get shorter, reducing activity hours. This triggers the almost entirely instinctive phenomenon of bird migration. Not only is bird migration an intriguing phenomenon for those who wish to know the source and destination of these birds, the study of bird migration itself is significant for humans in many ways.

Migration has considerable ecological significance. It enables birds to exploit peaks of food production and to settle in areas where they otherwise could not survive. The study of migration is important for our understanding of the global climate change phenomenon, the spread of avian diseases and areas important for conservation.

The study of migration has been through the marking of birds, field observations, and advanced studies like radar and satellite observations. Historically, migration was tracked through ringing studies. Bird ringing (also known as bird banding) consists of catching birds and attaching a small individually-numbered metal or plastic ring to their legs or

wings; if it is found later the bird and the ringing location can be identified by this number.

The migration study tool is a technique that involves affixing an inscribed metal ring to the left tarsus (leg) of a bird. This ring contains a unique serial number on the outside, and an address where recovered bands can be sent on the inside. Ring-recovery data is obtained when ringed birds are re-sighted, recaptured, hunted, or found dead.

The newer colour-marking technique as a modern tool uses a bright colour mark that enables observation of the bird from a distance through a telescope or binoculars without the need to capture/shoot the birds. The unique combination of colours and marks allows for the identification of individuals or marking locations. On the other hand, temporary plumage dyes are often used on large waders to aid short-distance movement studies.

Of late, sophisticated electronic devices such as transmitters and radars that can beam information on the movement of birds are being increasingly brought into use. However, the use of colour flags has transformed our understanding of the migration routes and identifying major staging areas of shorebirds. Coloured neckbands with alphanumeric engravings are also being widely used to tag waterfowl like swan and geese. Colour flags are coloured plastic rings that are shaped so that a tab extends from the ring providing a much larger viewable surface area than conventional colour rings.

After 2004, a trial using alphanumeric engraved colour flags was undertaken in Australia with a high degree of success. This system is now used increasingly throughout the East Asian-Australasian Flyway with very rewarding results, especially with the advent of digital cameras and “digiscoping” enabling photographs to be taken of flagged birds. Additionally, many bird-watchers, armed with binoculars or a spotting scope, are now able to see the various combinations of colour flags that help to establish the locality where the birds were originally marked.

Each country or region in the East Asian-Australasian Flyway uses a unique colour combination to establish where the bird was flagged. The position of the metal band is not required to determine the flagging location. For two-colour flag combinations the flag position sometimes varies with both flags often placed above the joint in large waders, and one above and one below the joint in the case of smaller waders. Engraved numbers and/or letters are used on many of the new flags. These help identify the date and place where the bird was flagged.

Sadly, there is no global register or system of colour marking of waterbirds, although there are well coordinated schemes for Eurasia/Africa through EURING and AFRING. In the Asia-Pacific region, colour coordinated schemes are limited to a few species/species groups in some flyways. The most advanced and coordinated programme in our region is run by the Australasian Wader Study Group which monitors five million shorebirds on the East Asian-Australasian Flyway.

In India, the most actively used migration corridor is the “Central Asian-South Asian Flyway”. Unfortunately, the

Central Asian Flyway Action Plan has been unable to establish any meaningful framework to promote a coordinated approach to bird banding activities and there is no accepted system or procedure in place to facilitate systematic observation or reporting. Bombay Natural History Society (BNHS) has been tagging migratory birds with metal rings since 1959 and is the only accredited ringer in India. Birds ringed in India have a poor recovery rate of less than 1%. Over 400,000 birds had been ringed by BNHS till 2002.

The Central Asian Flyway (CAF) covers a large continental area of Eurasia between the Arctic and Indian Oceans and the associated island chains. The Flyway comprises several important migration routes of waterbirds, most of which extend from the northernmost breeding grounds in Russia (Siberia) to the southernmost non-breeding (wintering) grounds in West and South Asia, the Maldives and British Indian Ocean Territory.

“Waterbirds” are those species of birds that are ecologically dependent on wetlands for at least part of their annual cycle, and have a range that lies entirely or partly with the Action Plan area. In addition to these groups, there are other birds also dependent on wetlands such as the kingfishers, birds of prey and passerines. These birds also benefit from efforts undertaken to conserve waterbirds.

Waterbirds use a wide variety of habitats during their annual cycle. This continental flyway comprises extensive large semi-arid habitats with a limited number of wetlands, particularly in the staging areas, and different groups of migratory waterbirds appear to overlap considerably in the usage of important sites.

The large coastal wetland areas and islands of South Asian countries provide good habitat for many species. Many of the wetlands are situated in areas with dense human populations where the wetlands provide many goods and services to the people, but where they are increasingly being unsustainably exploited. Thus the management of these habitats requires coordinated multi-sectoral and participatory planning and implementation to realise the needs of local people as well as biodiversity conservation.

Migratory species are essential components of the ecosystems that support all life on earth. As the pressure on these animal species steadily increases, mainly due to human-made threats and obstacles to migration, many of them are threatened with extinction.

The Convention on Migratory Species (CMS) is the only global convention dealing comprehensively with all aspects of the conservation of migratory species and the habitats on which they depend. There is an overlap between the CAF and the area of the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA), which was concluded in 1995 at The Hague, The Netherlands. Sixteen out of the 30 countries encompassed by the CAF are located in the AEWA Agreement Area.

Many countries along the CAF have developing or transitional economies with only modest allocation of resources for research and conservation, and for the



involvement of local stakeholders in sustainable management of wetlands, grasslands and other habitats. The call for the development of an Action Plan for the Central Asian Flyway has been recognised by various conventions and meetings. The Action Plan sets the agenda for enhanced regional environmental cooperation among the Central Asian Flyway states to promote the conservation of migratory waterbirds and their habitats. The Action Plan builds on and complements actions that are being undertaken by national governments to promote conservation.

The key reason for bird migration to the sites in their flyway is because they are highly productive for these migratory birds as well as for the non-migratory birds and biodiversity in general. Not only the birds, the people dependent on these resources (food, shelter and water) also benefit from these highly productive areas. However, migratory birds sometimes change their flyways due to key regulatory factors including hydro-climatic conditions, anthropogenic impact, food supply, urbanization, and weather.

India is known to support 1360 species of bird species, out of these 257 species are waterbirds. India has about 81 species of migrant waterfowl which are seasonal migrants, mostly from the Palearctic region beyond the Himalayas – in central and northern Asia and eastern and northern Europe. The most abundant and regular winter migrants are the ducks and geese, waders or shorebirds and cranes.

India remains in the core central region of the Central Asian Flyway (CAF) and holds some crucial important wintering population of waterbird species. India is also a key breeding area for many other water birds such as Pygmy Cormorant and Ruddy Shelduck, globally threatened water birds such as Dalmatian Pelican, Lesser White-fronted Goose,

Siberian Crane, Oriental White Stork, Greater Adjutant Stork, White-winged Wood Duck, etc.

India has developed supportive legislations to protect its resident waterbirds as well as wintering waterfowl. India also has bilateral arrangements with neighbouring nations as well as multilateral agreements to safeguard the migratory waterbirds, which migrate beyond national jurisdiction.

The National Wildlife Action Plan, duly supported by the Indian Wildlife (Protection) Act, 1972, provides a legal framework relating to migratory waterbirds and wetlands. In addition, various other legislations such as Environmental Protection Act, Indian Forest Act, Pollution Control Act, and Coastal Zone Regulatory Act are some of the additional legislations supporting wetland and migratory waterfowl habitats managements. Further, India is a signatory to most of the important international instruments on conservation, which include the Ramsar Convention on wetlands, Convention on Protection of Migratory Birds between India and Russia, and Convention on Migratory Species (CMS).

However, it is necessary to strengthen the conservation of wetlands and restoration of degraded wetlands, enhance public awareness on waterbird conservation, improve the enforcement of Wildlife Protection rules and crackdown on illegal hunting. Carrying out long-term waterbird surveys to clarify population dynamics, restoring populations of highly-threatened species through artificial intervention, and promoting international and regional exchanges and cooperation to share information about waterbirds and their conservation are also important.

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