

Mapping the Highways of the High Seas: New Marine Flyways for Migratory Seabirds

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“One day, the bird village decides to look for the most beautiful individual, one who is worthy of the most beautiful bird title.

There are some criteria. First, one must be able to make a living.

Second, one must be strong and brave, fly fast, and have a sturdy beak and sharp claws. Third, the wings must be pretty, the body well-balanced, and the face good-looking.”

In “Guru Bird”; *Wild Wise Weird* [1]

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Each year, millions of seabirds undertake extraordinary transoceanic migrations, navigating vast and often perilous marine environments. Yet, until recently, their ocean-spanning routes remained largely unmapped. In a global study, Morten et al. [2] harnessed three decades of tracking data from 48 pelagic seabird species to identify six major marine flyways that span the Atlantic, Pacific, Indian, and Southern Oceans.

Using a dynamic clustering method applied to nearly 3,966 migration tracks from 64 breeding colonies, the researchers revealed large-scale, repeatable migration corridors. These flyways often form intricate loops or figure-of-eight patterns, reflecting the influence of dominant wind systems and ocean currents. For example, the Atlantic and Pacific flyways mirror hemispheric gyres, while the Southern Ocean flyway traces a circumpolar route aligned with the Antarctic Circumpolar Current.

Unlike existing terrestrial and coastal flyway classifications, these marine flyways specifically encompass the routes of pelagic seabirds that forage and migrate primarily over the high seas—areas beyond national jurisdictions. The flyways are not only extensive but also flexible, with many species using different flyways across life stages or breeding cycles. Arctic Terns (*Sterna paradisaea*), for instance, traverse sections of the Atlantic, Indian, and Southern Ocean flyways during their annual migrations [3].

The conservation implications are urgent. Nearly 40% of the seabird species using these routes are globally threatened, and more than two-thirds face at least one significant marine threat, such as fisheries bycatch or pollution [4,5]. By delineating these shared migratory corridors, the study offers a robust framework for coordinated international conservation, particularly in regions beyond national governance.

This approach supports broader policy integration, including the Convention on Migratory Species, the Agreement on the Conservation of Albatrosses and Petrels, and the new High Seas Treaty. Crucially, these flyways underscore the deep interconnections between species, ecosystems, and nations. As seabirds rely on the stability of these marine pathways, their protection becomes a shared global responsibility—where safeguarding biodiversity also means sustaining the natural rhythms that bind us all [6,7].

References

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