

# Wetland suitability and connectivity for migratory birds along the Ionian flyway in Greece

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In the annual cycle of long-distance migrant birds, en route periods provide numerous challenges, risks and selective pressures. Intact migratory routes with adequate stopover opportunities are critical for survival, especially for birds that depend on restricted wetland areas during migration. Conserving migratory pathways for wetland dependent birds poses a unique set of challenges, because many reserves scattered across space are required for the conservation of any one species. The Balkans is very important for Palaearctic migratory wetland birds. Especially Greece, with its extension deep into the Mediterranean, forms a bridgehead from and towards Africa.

Our research intends to study the connectivity and the suitability of stopover sites for migratory wetland birds in western Greece. We evaluated site appropriateness for seven migratory bird species with different habitat needs through an extensive field campaign. High resolution satellite images (Google Earth Pro) were used to accurately classify all wetland sites by a typical vegetation classification and by assigning bird habitats based on our expert-knowledge. Our field campaign was performed during the peak migration of our focal species in April-May and included direct validation of site suitability by bird sightings and assessment of all possible, mostly human, disturbances for migratory birds. These disturbances might lead to possible reduction in suitable and available habitat for migratory birds.

Wetland connectivity will be assessed by applying a Flight Leg Allocation Problem model (FLAP), a distance-constrained shortest path problem (Downs Horner, 2008). It finds the optimal path between an origin and a destination habitat in the fewest number of stops and in the shortest distance. Since routes and sites during migration are relatively restricted, it might appear that some geographic locations are more critical than others for a particular species. This differential importance of sites and biotopes along migratory pathways allows us to suggest priority sites for conservation in Greece and possibly the wider Balkans for the protection of migratory birds. This is important in view of the political complexity and jurisdictional boundaries migratory birds cross while flying EU and non-EU stretches along their route. We also focus on the conflict between optimal migration route and the legal status and actual state of stopover wetlands.

## References

Downs J.A. and M.W. Horner. 2008. Spatially modeling pathways of migratory birds for nature reserve site selection. *International Journal of Geographical Information Science* 22:117-126.