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**Movebank - mapping global migration flyways with great accuracy across many species**

Thousands of biologists collect animal movement data but there are no tools to save or compare these. Most data are used once and then disappear into a filing cabinet. In January 2009 Movebank ([www.movebank.org](http://www.movebank.org)) launched an animal tracking data-base and web-portal. The first test of this system was to support a three day global raptor migration workshop at Hawk Mountain, Pennsylvania, in February 2009. Prior to the workshop participants identified Argos tracking studies from 38 species of raptor, for which data on start of migration, end of migration, annual migration distances, daily migration distances, and flight speeds were compared. This meta-analysis is supplemented with results from direct analysis of Argos tracking data for 20 species, which allows detailed intra and inter-species comparisons such as between continents, and between migration seasons. The applicability of the migration flyway concept is examined, migration diversity indices are presented, and migration bottle-necks are identified. Overviews of additional questions that are being addressed using this data-base, and potential uses of the system for other groups of ornithologists are provided.

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**Potential dispersal range and rate of H5N1 HPAI virus by wild waterfowl: estimation from satellite-tracked bird movements**

The rapid spread of highly pathogenic avian influenza (H5N1) viruses over Asia, Europe and Africa, contemporary to outbreaks in migratory waterfowl, has questioned the potential for wild waterfowl to spread H5N1 viruses. While these viruses are still circulating over these regions, a number of recent experimental infection surveys have revealed that some wild waterfowl can excrete H5N1 virus for several days before or without exhibiting clinical signs.

We here present the application of a large-scale satellite telemetry program to epidemiology. We evaluated the dispersive potential of H5N1 viruses by wild waterfowl through the analysis of the movement range and rate of satellite-tracked birds, in relation to the duration of potential asymptomatic viral shedding (DPAVS). Our review of all available inoculation surveys (120 birds from 15 wild waterfowl species) indicates that almost all infected birds show a period of asymptomatic viral shedding, ranging from 1 to 8 days. We compiled location data of more than 100 birds from more than 10 species of Anatidae we had equipped with PTTs in Africa and Asia. We then measured the magnitude, speed and frequency of bird movements during time frames corresponding to values of DPAVS.

Our analysis confirms that wild waterfowl have the potential of being long-distance vectors of H5N1 viruses. Satellite-tracked birds were able to perform long-distance movements (up to 3000 km) during short periods compatible with DPAVS. However, their general dispersive potential was low. Long-distance dispersals (>100 km) were only occasional, with magnitudes no more than 1000 km for most ranging or migration movements, extensive distances being covered only when birds crossed large natural barriers. In addition, time between separate long-distance dispersals was generally longer than DPAVS, preventing birds from spreading viruses through successive long-distance flights.