

## **14.2 EUROPE-WIDE PATTERNS OF NOCTURNAL AVIAN MIGRATION FROM WEATHER RADAR DATA**

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Reliable quantification of bird migration systems is inherently difficult as much migration goes undetected, at night or high altitude, but also because of the sheer number of animals involved and the large spatial scales over which migration occurs. Within the framework of COST action ENRAM (European Network for the Radar surveillance of Animal Movement), we used the network of European weather radars to investigate nocturnal bird movements. For the first time we mapped migration at the scale of the entire European flyway. By extracting biological information from 70 weather radar stations from northern Scandinavia to Portugal, we provide a continental view of nocturnal bird migration during the autumn migration season of 2016. We map the major migration directions and show the intensity of movement as birds migrate along the West European flyway. We quantify migration intensity through different parts of Western Europe, and show how blocking weather conditions can aggregate migration into cumulative waves moving through Europe from the north to the south. By studying migration at the novel scale of synoptic weather systems, the structuring effect of continental wind patterns on the general flux of migration is revealed. This first continental-scale study using the European network of weather radars demonstrates the wealth of information available and its potential for investigating large-scale bird movements over Europe, with consequences for agriculture, domesticated animal and human health and civil and military aerial transportation.