Bird migration across the Bay of Biscay observed by meteorological radar

Nadja Weisshaupt

Department of Ornithology, Aranzadi Sciences Society, Spain

Maruri, Mercedes (Basque Meteorology Agency (EUSKALMET); TECNALIA-Energy and Environment Division-Meteo Area; Department of Applied Mathematics, University of the Basque Country UPV/EHU, Bilbao, Spain)

Arizaga, Juan (Aranzadi Society of Sciences, San Sebastian, Spain)

E-mail: n_weisshaupt@yahoo.com

Migratory pathways of birds are strongly determined by geographical barriers such as mountain ranges, deserts or large water bodies and it is well known that many migratory bird species have developed strategies to avoid or reduce the crossing of barriers. Due to the vast dimensions of both bird movements and barriers and often adverse conditions prevailing in such areas, radar technology has proved to be a useful tool that is in many ways superior to other methods used in bird migration studies such as visual counts or bird banding due to less expenditure of time and effort, better applicability for large-scale monitoring.

Along the Bay of Biscay a network of radars has been established for meteorological purposes monitoring the respective area continuously. It has been known from other sites that these radars do not only register meteorological phenomena, but also biological targets.

As the Bay of Biscay is situated along the migratory route from southern Scandinavia to the Iberian Peninsula it is considered a geographical barrier, however, its importance in avian migration is still unknown. For reasons of population dynamics and conservation it is important, though, to understand and investigate its role during bird migration. The question arises if the local radars are suitable as a bird observation tool in the area.

After a literature review on the topic, biologists from the Basque institute Aranzadi revised historical radar data obtained from a wind profiler from Euskalmet to check for patterns of possible biological origin at night. In a table each day was assessed as to presence or absence of biological signals as well as presence or absence of precipitation.

To substantiate the biological origin of the patterns, complementary verification systems were applied during the season and the hours when the signals occurred in the historical dataset.