

Highly Pathogenic Avian Influenza: a tool providing visualisations of wild bird movements to help with the ongoing challenge

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INTRODUCTION

In Europe, seasonal incursions of highly pathogenic avian influenza (HPAI) viruses via wild birds have resulted in large numbers of poultry deaths and flock depopulation during the last few years. The epidemiological characteristics of these epidemics varied depending on the virulence of the strains being introduced, and the amount of farm to farm transmission. Nonetheless, some patterns in the initial phase of the spread of the disease have been associated with the movement of wild birds, particularly water birds on their autumn migration. As wild bird migration is a natural phenomenon, any attempt to control the spread of the disease should focus on awareness and the creation of mitigation strategies at the interface between poultry and wild birds. To help with the awareness and early warning capabilities of Member States (MS), the British Trust for Ornithology and the Catalan Ornithological Institute, on behalf of the European Union for Bird Ringing (EURING) and the European Bird Census Council (EBCC), and supported by EFSA, developed a tool (Migration Mapping Tool (MMT)) to visualise the location and connectivity of the wild bird species of relevance for the control of HPAI.

METHODOLOGY

This new MMT aims to provide EFSA and other users with information on the movements of the 50 wild bird species that are the targets for passive surveillance of HPAI in the EU. The new tool builds on and largely replaces the functions provided by the previous Migration Mapping Tool that was developed for a more limited range of species in 2007 (<https://euring.org/research/migration-mapping-tool>). The new tool uses ring recovery data from the EURING databank (<https://euring.org/data-and-codes/euringdatabank>) together with occurrence data from EuroBirdPortal (<https://www.eurobirdportal.org>). The mapping tool was created using Java and Javascript, with the underlying data being held in an Oracle database. Citizen data from EuroBirdPortal are automatically updated on a weekly basis and are displayed using a 30x30 km resolution. EURING ringing and recovery records are presented using focal regions of origin and destination.

RESULTS

For each species, species group or for all species combined, the following outputs using ring recovery data can be retrieved from the tool: i) maps of birds ringed in any focal area at any time of the year, showing the distribution of recoveries by month, ii) maps of birds ringed in a focal area in either spring, summer, autumn or winter, showing the distribution of recoveries by month, iii) tables of movements between focal areas. For any pair of focal areas, the tables will show the month encountered in focal area 1 vs the month encountered in focal area 2, with numbers in each cell of the table being the number of encounters recorded and iv) for each of the four seasons and for any species or species group present in a focal area, a table showing the area of second encounter by month. Live citizen data on relative abundance can be displayed as a background layer for all the species. A 5-year running average of the maximum counts of birds of the selected species can also be displayed as a background.

DISCUSSION

The MMT is designed to help EFSA, MS and the EC with early warnings for incursions or the spread of HPAI viruses. This tool, although very simple to use, provides more than 100 years of ring recovery data from the EURING databank as well as live citizen data on the distributions of the species in the target list for HPAI. Based on these data, users can assess the areas where bird species have been recovered after having been ringed in an area of interest. This area of interest, or area of origin, could then be selected by the user depending on the latest reports of HPAI viruses within and outside Europe, helping to anticipate the most likely locations for subsequent outbreaks. The MMT has been designed to allow for future add-ons, such as the provision of automated risk maps. Prevention is a key action for the control of HPAI. This tool will help to enhance our knowledge of wild bird movements and will assist planning of informed management actions to prevent HPAI incursions and transmission within the EU. By sharing this tool with MS, EFSA aims to empower them, to ensure swift decision making in relation to awareness, preparedness, and control of this disease.