



PRESS RELEASE

The decline in the population of wintering geese in Doñana threatens plant dispersal

- A scientific team from the Biological Station of Doñana (EBD-CSIC) has studied the seed dispersal capacity of geese and how changes in their migratory patterns could have implications for this ecological function.

These birds help plants disperse their seeds over distances they would not be able to reach by any other means.



Greylag Goose (Anser anser) during their migration. Credit: Eloy Revilla

Seville, 25th October 2024. A new study led by researchers from the Doñana Biological Station (EBD-CSIC) shows how wintering graylag goose (*Anser anser*) disperse a large number of seeds of different plant species in the marshes of the Guadalquivir and its surroundings, in southwest Spain. Due to the drastic reduction of geese in Doñana in recent years, this important dispersal function could be at risk. The research, published in the journal [Freshwater Biology](#), compares the diversity of seeds dispersed in the different habitats used by these birds at the beginning and end of their wintering.

This study is the first to analyse the potential of common geese as seed dispersers on their wintering grounds. It analysed 151 goose faeces, from which 1,196 seeds of 24 different species were extracted. “Eight of these were unknown to be dispersed by waterbirds” explains Iciar Jiménez-Martín, a pre-doctoral researcher at the Doñana Biological Station. “In addition, we confirmed that most of these seeds maintained the ability to germinate after going through the digestive tract of birds”.

The researchers then combined this information with data from the movements of three geese equipped with GPS devices during the breeding season in Denmark, which gave a rough idea of where they might be ingesting the seeds and where they might be transporting them.

“The results revealed that in November, at the beginning of the wintering season, geese were distributed between the flooded areas of the marshes of Doñana National Park and the nearby recently harvested rice fields. However, at the end of the wintering season, geese were concentrated in the few areas of the marsh that maintained water in a year with little rainfall”, explains Adrián Monreal, a pre-doctoral researcher at the Doñana Biological Station (EBD-CSIC) as well. The samples collected in these areas revealed that the birds ingested more seeds when feeding in the natural marshes, especially at the beginning of the wintering season than when feeding in the rice fields.

Dispersal at risk due to a reduction in goose numbers

Waterbird censuses carried out by the research centre since the 1970s reveal that the number of geese — which in some years had reached up to 80,000 individuals during the wintering season— has been drastically reduced in recent years. The Environmental Monitoring Team of the ICTS Doñana registered around 12,000 individuals in the winter of 2021-2022, while in the winter of 2022-2023, the number of geese did not exceed 10,000. This last winter, the numbers were even more critical, with only 4,300 individuals noticed.

“A few decades ago, Doñana was the main wintering site for the European population of the Greylag Goose. However, in recent winters, the number of individuals has been progressively reduced due to the lower level of water at the marsh. That would be a consequence of the over-extraction of water from the aquifer, low rainfall, and climate change”, explains [Andy J. Green](#), CSIC Research Professor at the Doñana Biological Station.

Geese can play a crucial role in connecting different plant populations at a local scale, as they can transport their seeds between different areas of the marsh. Nevertheless, if their numbers continue to decline, plants could lose this vehicle for seed dispersal. On the other hand, geese also disperse seeds to more northerly

latitudes during their return to breeding grounds in northern Europe. This may allow plants to reach cooler latitudes, to cope with rising temperatures caused by climate change.

Reference:

Iciar Jiménez-Martín, Adrián Monreal, Víctor Martín-Vélez, María J. Navarro-Ramos, Anthony D. Fox, Ádám Lovas-Kiss, Andy J. Green. **High levels of seed dispersal by a declining wintering population of migratory geese.** *Freshwater Biology*, <https://doi.org/10.1111/fwb.14347>