PRESS RELEASE

New study shows that seagulls transport hundreds of kilos of plastic from landfills into natural reserves

- **Researchers from the Doñana Biological Station (EBD-CSIC) have developed a plastic deposition model based on the diet and movement of gulls monitored by GPS telemetry, while feeding in landfills in Andalusia, South-West Spain.**
- **Modelling shows that gulls can transport an estimated 400 kg of plastic each winter from landfills into the Fuente de Piedra lake in Malaga, an internationally important nature reserve famous for its flamingo colony.**

Gaviotas sombrías en la Laguna de Fuente de Piedra en Málaga. / Víctor Martín Vélez

Sevilla, 15th February 2024. An international scientific team led by the Doñana Biological Station (EBD-CSIC), of the Spanish National Research Council (CSIC), has investigated the role of gulls in the

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dispersion of plastics in natural wetlands. The study, published in the journal *Waste Management*, has focused on Lesser-Black Backed Gulls *(Larus fuscus*), a species that is very abundant in winter in Andalusia. This research is part of the GuanoPlastic research project, funded by the regional Andalusian government, Junta de Andalucía.

Waterfowls, such as gulls, can play a major part in the movement of contaminants. Plastics and other debris (such as glass and textiles) can be ingested at open landfills and then expelled at roost sites, mostly in regurgitated pellets. Swallowing plastics is bad for bird health, and can be fatal, but this biovectoring can also cause wider ecological problems through bioaccumulation of plastics in natural ecosystems.

"Until now, studies related to plastic in birds have role of waterbirds in lakes and other inland waterbodies. In recent years, plastic accumulation in wetlands has started to receive more attention", explains Dr. Víctor Martín Vélez, a CSIC researcher who at the time of the study worked at the EBD-CSIC and is currently a scientist at the Institute of Marine Sciences (ICM-CSIC).

For the research, 45 gulls were monitored between 2010 and 2017 using GPS tags fitted in breeding sites in the UK, the Netherlands, and Belgium. The movement patterns were combined with bird counts at the Fuente de Piedra lake, in southern Spain, and diet studies investigating the contents of regurgitated pellets, to estimate the quantity and types of plastic deposited by the concentrations of up to twenty thousand individual gulls wintering at the lake.

Lesser-Black Backed Gulls are a species that is very abundant in the Fuente de Piedra Natural Reserve. Their numbers have increased since landfills were created in many parts of Andalusia, where they ingest plastic and other debris mixed with organic waste. GPS data shows they fly up to 80 km each way from the lake to feed in the landfills.

Plastic, glass and textiles

86 % of pellets regurgitated in the lake contained plastics, and 94 % contained other debris such as glass and textiles. The research team included laboratory techniques such as plastic classification by Fourier-Transform InfraRed spectroscopy (FTIR) to develop a mathematical model of biovectoring. An average of 400 kg of plastic has been deposited each winter at the lake, with a peak of 800 kg in the winter of 2019-2020 (made up of an estimated 16 million plastic particles). The weight of non-plastic waste deposited in the lake is even greater. Polyethylene (54 %), polypropylene (11.5 %) and polystyrene (11.5 %) were the main plastic polymers in the waste.

"Ours is the first study of this biovectoring of waste by gulls from open landfills to lakes anywhere in the world", explains Doñana Biological Station. And "you can see that what they eat is by far the biggest source of plastics entering Fuente de Piedra Lake". Once into the likely to stay there, as there is no outflow, and end up breaking down into microplastics that impact other fauna, including the flamingos.

Across Europe and in many parts of the world, gulls forage in landfills or on other sources of human waste, then roost in lakes and other wetlands in a similar way, and this study quantifies what is likely to be a widespread problem for natural areas. "When we throw being carried by birds into wetlands. It's another reason we generate" explains Dr. Víctor Martín Vélez.

Reference

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The research team included scientists from the University of Cádiz, University of Sevilla, and institutes in the UK, the Netherlands and Belgium.

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