

On a warming planet, these Arctic geese rapidly found (and shared) a new migratory route

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Pink-footed geese taking off from the roost. Credit: Jørgen Peter Kjeldsen

As the planet warms, animals that breed in the Arctic are at particular risk. But a new study reported in *Current Biology* on March 1 offers some encouraging news: in an apparent reaction to pressures along their former migratory route, a population of Arctic geese has rapidly adjusted, forming a new migration route and breeding location almost 1,000 kilometers from their original stomping grounds.

What's more, it appears the new route has caught on with other [geese](#) and even birds of other species via cultural transmission ([social learning](#)). As such, the new [population](#) already has grown to as many as 4,000 individuals.

"It is extremely fascinating to witness such rapid evolution of new breeding grounds and migratory route by a [bird species](#) that is regarded as being very traditional in its behavior and site use," said Jesper Madsen of Aarhus University in Denmark. "It gives some hope for 'ecological rescue' at times of very radical environmental changes due to [climate change](#) and, more broadly, global change."

"We observe a new distinct population of birds in the making in real time," he added. "This is very rare to observe. The speed of the development is astonishing."

Madsen's team has been studying Norway's Svalbard population of pink-footed geese for more than 35 years. They've kept tabs on their [population size](#) and demographic variables, using a systematic marking and resighting program. About 20 years ago, they started getting reports of geese turning up on migration in Sweden and Finland, which were confirmed as members of the Svalbard population.

To learn more, Madsen went to Oulu, Finland, in the spring of 2018 and 2019 with his goose-catching team from Denmark as well as Dutch and Finnish partners. Their hope was to catch and tag some pink-footed

geese with GPS tags. They wanted to know where these geese were going, and they got an unexpected answer.



The team with the 'catch of the day' in Oulu in April 2018. Credit: Esko Pasanen

"It was a real surprise to see that half of the marked individuals in Oulu migrated northeast to Novaya Zemlya in north Russia," Madsen says. "From the tagging information we could not only follow their new path but also got indications that females were breeding there. This site is around 1,000 kilometers east of the Svalbard breeding grounds.

"It was also cool to observe that geese from the traditional flyway have turned up on the new route and seemed to have switched. Hence, social learning and following individuals from the new route has been an important phenomenon, which also explains how this development could be so fast."

With their new report, they've now documented an abrupt formation of a new migration route and population for the Arctic geese over the course of 10 to 15 years. The population has grown over time due to successful breeding and high survival rates combined with continued immigration of geese from the old route to the new one.

Their ability to live in Novaya Zemlya has apparently been aided by warming in the area, they say. While the new population is not genetically or demographically isolated yet, they note that it already now qualifies as a separate population.

The new route does have some disadvantages, Madsen says. For instance, it's longer. But they suspect the benefits of the new [route](#) and grounds outweigh any downsides. The findings in geese show the importance of social learning on a changing planet, Madsen notes, especially in [social animals](#) including birds but perhaps also hoofed ungulates, wolves, and whales.

"At this time, when climate change and other human activities threaten many species, not least the Arctic ones, social learning can be a behavior that can provide advantages to avoid some [negative impacts](#), at least in the short term," Madsen says.

The researchers say they hope one day to observe the geese in their new breeding grounds in Russia. For now, they'll keep an eye on the future development of the new population using GPS-tracking devices and remote sensing of the new environment.

More information: Jesper Madsen et al, Rapid formation of new migration route and breeding area by Arctic geese, *Current Biology* (2023). [DOI: 10.1016/j.cub.2023.01.065](https://doi.org/10.1016/j.cub.2023.01.065)

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