



Naturhistoriska
riksmuseet

Pressmeddelande



2020-10-27

No genes from the greater white-fronted goose in Sweden's lesser white-fronted geese

An analysis of genomes from the critically endangered lesser white-fronted goose in Sweden shows that there are no hybrids with the closely related greater white-fronted goose. The result will facilitate the species' conservation work.



A concern that hybrids between the lesser white-fronted geese and the greater white-fronted goose have gained a foothold in the wild population has complicated the conservation work with the Swedish lesser white-fronted goose. The lesser white-fronted goose is one of the most endangered bird species and red-listed both in Europe and in Sweden.

Due to a reduction in the number of lesser white-fronted geese, Sweden started a reinforcement project in 1981 where a total of 348 captive-bred individuals were released during 18 years. The release stopped in 1999, when genetic analyses indicated that some individuals in the captive stock had mitochondrial genes from its sister species, the greater white-fronted goose.



Pressmeddelande

Now, researchers from the Swedish Museum of Natural History have mapped the entire genome of 21 lesser white-fronted geese from the wild populations in Sweden, Norway and Russia. The study was published in the journal *Scientific Reports* on October 27, 2020.

- The DNA study showed that there are no hybrids between the lesser white-fronted geese and other goose species among Sweden's lesser white-fronted geese, says David Díez-del-Molino who is a researcher in population genomics at the Department of Zoology at Stockholm University.

The results also showed that the Swedish lesser white-fronted goose population has been genetically separated from other populations. However, the Russian and Norwegian lesser white-fronted geese are very similar genetically, which indicates an extensive contact between the geese in western Russia and northern Norway.

Isolation leads to inbreeding

When small and declining populations become isolated, it usually leads to a reduced genetic variation. There has therefore been a concern that the Swedish and Norwegian lesser white-fronted geese had a reduced viability caused by inbreeding and low genetic variation.

- When we analyzed the lesser white-fronted geese's DNA, we saw a much higher inbreeding rate in the Swedish population compared to the populations in Norway and Russia, says Love Dalén, professor of evolutionary genetics at the Swedish Museum of Natural History. We will now do in-depth analyses on additional samples to investigate whether this inbreeding is a new phenomenon or has roots thousands of years back in time.

DNA in conservation work

The researchers also hope that this study can inspire other conservation projects that use releases as a tool. The results show how important it is to use genetic monitoring of both populations in the wild and in captivity. Such monitoring is particularly important when planning to strengthen existing endangered populations with individuals raised in captivity, as in the case of the lesser white-fronted geese.



Naturhistoriska
riksmuseet

Pressmeddelande

- These results will be very important for future action programs, guidelines and other initiatives to preserve the lesser white-fronted goose, both at national and international level, says Niklas Liljebäck, who is co-author of the study and project manager for the Swedish lesser white-fronted goose project.

The article in [Scientific Reports is freely available via this link](#).

The study has been funded by the Swedish Environmental Protection Agency and the Swedish Hunters' Association. The SciLifeLab infrastructure in Stockholm has contributed with support for large-scale sequencing and computational biological analyzes.

Photo Projekt Fjällgås.

Contact

David Díez-del-Molino

(Engelska, spanska)

diez.molino@gmail.com

Zoologiska institutionen, Stockholms universitet

+46 (0)73 951 29 22

Love Dalén

(Svenska, engelska)

love.dalen@nrm.se

Enheten för bioinformatik och genetik, Naturhistoriska riksmuseet

+46 (0)70 777 27 94

Niklas Liljebäck

(Svenska, engelska)

niklas.liljeback@jagareforbundet.se

Svenska Fjällgåsprojektet

+46 (0)70 33 00 680

Martin Testorf

Vetenskapskommunikatör vid Naturhistoriska riksmuseet

mt@nrm.se

Tel 08-519 540 37, 0709 429 011



Naturhistoriska
riksmuseet

Pressmeddelande

Fakta om Naturhistoriska riksmuseet

Genom att vara en arena för kunskap, upplevelser, samtal och debatt vill vi bidra till att öka allas kunskap om vår gemensamma miljö och natur samt bidra till att påverka och förnya landets miljö- och naturvårdsarbete. Våra samlingar utgör ett fantastiskt arkiv med över elva miljoner föremål. Här kan du besöka utställningar på olika teman och delta i programaktiviteter. På kupolbiografen Cosmonova visas filmer i världens största filmformat, IMAX, som sätter dig mitt i äventyret!