

Reintroduction of lynx requires larger numbers to avoid genetic depletion

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The Eurasian lynx (*Lynx lynx*) is the largest European cat species. Credit: Katarina Jewgenow/IZW

For successful reintroduction of lynx into the wild, the number of released animals is crucial. If only a few lynx are reintroduced to found a population, the genetic diversity is too low to ensure their long-term sustainability. An international research team has recently published these findings in the scientific journal *Conservation Genetics*. The researchers highlight the need to strengthen newly established European lynx populations by additional translocations of lynx as well as other conservation measures.

Scientists of the German Leibniz Institute for Zoo and Wildlife Research (IZW), the Bavarian Forest National Park (Germany), the Polish Academy of Sciences (Poland) and the Russian Academy of Sciences (Russia) investigated the [genetic](#) status of two [lynx](#) populations in the Bohemian-Bavarian and Vosges-Palatinian forests in central Europe.

The Eurasian lynx (*Lynx lynx*) is the largest European cat species and has been protected in the EU since 1992. Originally spread throughout all of Europe, the species is now mainly limited to protected areas such as national parks. Current populations only exist because countries have invested a considerable effort to protect lynx in Europe or to reintroduced them to suitable habitat in its former range. Reintroduced populations face some specific challenges: "Our results show that these reintroduced populations usually consist of too few individuals to be self-sustaining. Small populations are highly vulnerable to loss of genetic variation because each individual represents a high percentage of the [population](#)'s gene pool," explains Daniel Förster, geneticist at the IZW.

The population in the Bohemian-Bavarian forest was founded by introducing 5 to 10 lynxes in the 1970s and later supplementing them with 18 additional individuals. The population in the Vosges-Palatinian forest was founded by 21 lynxes released between 1983 and 1993. From this already limited number of founders, only some individuals actually produced offspring. "From a genetic point of view this means that the

few founder animals represented little genetic variation," says Jörns Fickel, coauthor of the study and also a geneticist at the IZW. To assess the effect of the reintroduction on the genetic status of these two lynx populations, the scientists compared their [genetic diversity](#) with those of naturally occurring lynx populations in Eastern Europe. For this purpose they analysed molecular markers in lynx DNA obtained from faecal, blood, and tissue samples.

The study showed that these two populations displayed very low genetic diversity in comparison with other European lynx populations, with far fewer genetic variants present in the new populations than in the naturally occurring populations. A previous study on a reintroduced lynx population in Slovenia and Croatia already indicated that small reintroduced populations suffer from low genetic diversity. The current study now confirms these findings and thus points towards a more general pattern: Small populations are unlikely to survive in the long term. According to the authors of the study, it is well justified to classify the Bohemian-Bavarian population as "endangered" and the Vosges–Palatinian population as "critically endangered" as is currently done by the International Union for Conservation of Nature and Natural Resources (IUCN Red List). Thus, suitable measures for their 'genetic reinforcement' and conservation need to be taken.

Especially for [small populations](#) it is crucial that not a single individual dies before it has reproduced – be it of natural causes or poaching. "It is therefore really important to reduce the illegal killing of lynx to establish and maintain a long-term viable population" emphasizes Förster. He and his colleagues also advocate the reintroduction of more lynxes to directly strengthen the genetic variability of the populations. Indirect conservation measures such as setting up wildlife corridors can further facilitate the genetic exchange between neighbouring populations and thus contribute to the strengthening of the overall lynx population as well.

More information: James K. Bull et al. The effect of reintroductions on the genetic variability in Eurasian lynx populations: the cases of Bohemian–Bavarian and Vosges–Palatinian populations, *Conservation Genetics* (2016). [DOI: 10.1007/s10592-016-0839-0](https://doi.org/10.1007/s10592-016-0839-0)

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