LETTERS

Immigration and population growth are crucial to making Sweden's inbred wolf population sustainable.

Edited by **Jennifer Sills**

Planned cull endangers Swedish wolf population

In May, the Swedish Parliament announced a goal to reduce the Swedish wolf population from about 400 to about 200 individuals (*1*). This action further threatens this highly endangered population, which is genetically isolated and inbred. Scientific advice for improvements has not been implemented (*2*, *3*).

The Swedish Parliament proposed this drastic cull at a time when biodiversity is a global focus. The 50-year anniversary of the first UN conference on the environment was celebrated in June, and the UN Convention on Biological Diversity (CBD) will soon finalize its global biodiversity framework for 2020 to 2050. Sweden's actions are inconsistent with the country's obligations under the CBD and European Union law.

Few wild populations are as well studied as the Scandinavian wolf. Genetic monitoring has provided a full pedigree since the population was reestablished in the 1980s after extinction, and the data confirm persisting genetic isolation (*4*–*6*). Hunting, conducted both legally and illegally, has prevented population expansion and the influx of genetic variation.

Three founders comprised the population's genetic origin until 2007, and only three more wolves have subsequently contributed genetically to the present population (*6*). The genetic base is thus extremely narrow, and genomic erosion has been confirmed (*7*, *8*). The average level of inbreeding is similar to the level found in the offspring of two full siblings (*6*). Inbreeding in this population has been shown to reduce litter size (*4*). Also, high frequencies of anatomical defects (*9*) and male reproductive disorders (*10*) have been observed.

To make this population viable, population size and immigration must increase. So far, the population has been too small, and limited immigration followed by inbreeding could lead to extinction, similar to the Isle Royale wolf population (*11*). The goal should be to recreate a well-connected metapopulation spanning Scandinavia and Finland with a genetically effective population size of over 500, in line with the proposed CBD indicator (*12*). Considerably more genetic exchange than the current one-migrant-per-generation aim is needed (*3*).

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COMPETING INTERESTS

This work is the view of the authors and not necessarily that of the agencies they represent.

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End animal testing for biosimilar approval

Drug toxicology testing in animals has long been a standard requirement for establishing the safety of both new drugs (*1*) and copies of biological drugs coming off patent, known as biosimilars (*2*). Recently, the international community has acknowledged that this type of test may not be necessary or useful. Although policies for new drug approval are in the process of changing, biosimilar approval policies have been overlooked. Regulatory agencies should update these policies to streamline the biosimilars approval process and to prevent unnecessary, and thus unethical, animal testing.

Policies requiring animal toxicology studies to test biosimilars often stipulate the

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