

Wolverines (*Gulo gulo*), like all large predators, are facing difficult times in our developing world. They don't only stand in direct conflict with humans, they are also losing their habitats and migrating routes to road building and city development. Large home ranges, specific habitat requirements and a lack of public recognition and support makes the conservation of large predators an increasingly difficult task. Wolverines are quite astonishing. They are arctic animals that thrive on snow, live as hunters as well as scavengers and roam gigantic areas in search of prey and mates. Habitat destruction and fragmentation is one of many, but a crucial factor in the decline of the species. One major consequence is the loss of genetic diversity due to the repression of gene flow (the breeding of animals that are little or not related to each other).

This study is based on genetic data sampled from wolverines all over Sweden and Norway, a collaboration project of the Norwegian Directorate for Nature, the Swedish Environmental Protection Agency and the group Monitoring of Large Predators from Uppsala University. I used genetic data to estimate each sampled individual's membership or relatedness to a genetically distinct group. Different statistical tests confirmed that there was one population situated in the southwestern part of Norway that was genetically different from all other groups. Some migrating individuals could be identified, but the general pattern showed that there had to be something that separated that particular population from the others. To make more clear what was going on, I combined the genetic data with geographical data of the samples, then created different maps that showed all individual samples in the colour of the genetic group they belong to.

Looking at those maps, something peculiar struck me. The border to the southwestern population seemed unnaturally straight and broad and it ran directly South of the Norwegian city of Trondheim and the E14 road that runs East towards and beyond the Swedish border. I called that border the 'Trondheim belt'. But a comparatively small city and road could not be the only reason for such drastic partitioning. To get more insight into what was happening there I rummaged through human demographic data of the NORDREGIO website. There I found and downloaded maps with information on human development, population density and growth between 2003 and 2013. When I laid the geographic points of the genetic data over the maps, one could see that my newly labelled 'Trondheim belt' is actually a relatively highly populated area and, more importantly, an area of immense growth. In fact, it is one of the most expansive areas in all of Norway. And where there is growth, there is construction. That belt, running all the way from the West coast to the Swedish border has been under construction for the last decade. It's no proof that construction is the only factor for the partitioning or structuring of the wolverine population, but there is certainly much reason to consider further studies with more genetic data on not only the wolverine, but on other large and small animals, as well, to investigate the negative impact of human growth areas and possible solutions. One possible solution, that has been shown to highly increase animal movement and decrease road accidents, is the construction of so called 'Wildlife crossings' or 'Animal bridges'. Animal bridges are wide, vegetated bridges across roads or other for animals unconquerable obstacles, to help animals pass easily to feeding or breeding grounds and new territories. A few well-placed bridges could help to decrease road accidents with wildlife, serve animals that searching for food or new territories as well and most importantly support the long-term survival of species by allowing gene flow and thus genetic diversity.