The value of moving animals or plants from a stable population into one that is endangered or even extinct has been questioned, with some suggesting that it will mean that the new population is not well adapted to its environment. However, research on an endangered toad has shown that even when individuals were translocated from great distances, the population was able to genetically adapt to local conditions within a few generations.

Translocation for conservation: helping or harming wild populations?

The European fire-bellied toad is a critically endangered amphibian inhabiting the agricultural landscape surrounding the Baltic Sea. Translocation has been used as a conservation tool to support some of its smaller endangered populations. However, there is concern that individuals not genetically adapted to their new environment will pass on their maladapted genes.

In this study, partly conducted under the LIFE-Bombina project, researchers examined the genetics of two populations (Stodthagen and Högsdorf) in Schleswig-Holstein, the northernmost state of Germany. Both populations were thought to be supplemented using individuals from local populations; Stodthagen in 2004 under the LIFE-Bombina project, and Högsdorf in 2001 under a private initiative. The researchers took saliva or toe clipping samples of 18 individuals in Stodthagen and 30 in Högsdorf.

The researchers then examined the genetics in two different ways. Firstly, they looked at DNA which was associated with the function of the immune system and therefore likely to be extremely important for adaptation to local pathogens. Secondly, they examined 'neutral' DNA, which does not affect the animal or its adaptation to the environment, and therefore can be used to trace its ancestral origins.

The results demonstrated that the genetics of the Stodthagen population was as expected; because it was founded using individuals from nearby populations, the toads had very similar genes to those in the local area. However, using the neutral DNA to trace the origins of the Högsdorf population, researchers showed that many individuals used to found the population had not been local, and in fact, were almost certainly from Austria, many hundreds of miles away.

The authors speculate that this may have been the result of illegal releases, either at the Högsdorf site or in other populations which were used to supply individuals for the translocation project. However, a particularly important result was shown when they examined the immune system DNA of Högsdorf individuals. Despite the likely Austrian ancestors, their immune genes resembled the local populations much more closely than those in Austria.

This suggests that because of the strong advantages of local adaptation, individuals with locally-adapted genes were more likely to survive, and therefore the population overall maintained a good level of local adaptation. This implies that translocations may not actually be a threat to populations; however, researchers do caution that to ensure success, translocated individuals should always be in the minority within the local area.