

# Science for Environment Policy

## Golden jackal should not be treated as an alien species in Europe

**Expansion of the golden jackal (*Canis aureus*)** across Europe has led to its designation as an alien species in some Member States. In the first continent-wide study of the species, researchers characterise the genetic structure of the European population and attempt to identify its origin. The results suggest the golden jackal was not introduced to European countries by humans and therefore should not be treated as alien.

**Molecular biology techniques allow scientists to interrogate the genetics of a population**, improving understanding of wildlife ecology and processes, including population expansion. DNA testing can relate historical processes to genetic diversity and even reconstruct routes of colonisations, range expansions and biological invasions. In terms of practical benefits, it can guide wildlife management and help to protect endangered species.

In this study, researchers from across Europe studied the geographic expansion of the golden jackal (*Canis aureus*). Like many other carnivores, the golden jackal has expanded its distribution in Europe and, most recently, in the Baltic States. The first observations of jackals in the Baltics were made in 2011 in Estonia. In 2013, several animals were detected in Estonia and Latvia and, in 2015, the first jackal was found in Lithuania.

This expansion has generated concerns about negative effects on other wildlife species and livestock (e.g. via predation or transmission of pathogens). As a result, the jackal has been named an alien potentially invasive species in the Baltic States. However, as the true origins of European jackal populations are unknown, this may not be the most appropriate management option.

This study is the first to characterise the genetic structure of the European golden jackal population on the continental scale. The researchers included samples from regions that haven't previously been studied, including populations from the Peloponnese Peninsula in southern Greece, the Greek island of Samos and the Caucasus. The authors also attempted to identify the origin of the more recently established population in the Baltic States, which has a more controversial status.

To understand the genetic differences between populations, the researchers analysed the DNA of 97 jackals from five different regions: south-eastern Europe, the Caucasus, the Baltic States, southern Greece and the island of Samos. Tissue samples were taken from animals that died in vehicle collisions, due to natural causes or as a result of legal hunting – they were not killed for the purpose of the study.

Analysis of molecular markers revealed higher genetic diversity than has previously been reported for European jackal populations but less diversity than other wild canids such as wolves. This, the authors say, reflects the jackal's 'unique history' among carnivores in Europe, namely dramatic population decline and extinction of local populations in the past, followed by recent expansion of the species in central and northern Europe.

In terms of the origin of European jackals, the genetic data suggest that Baltic jackals originate from the Caucasus and south-eastern Europe. This opposes the idea that jackals were introduced by humans (as it is unlikely that jackals were captured in two different regions and smuggled to the Baltics). Based on their data and past studies, the researchers say it is possible for individual golden jackals to move across hundreds of kilometres in human-dominated landscapes, which could explain the recent pace of expansion in Europe.

*Continued on next page.*



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1. [http://ec.europa.eu/environment/nature/conservation/species/carnivores/pdf/guidelines\\_for\\_population\\_level\\_management.pdf](http://ec.europa.eu/environment/nature/conservation/species/carnivores/pdf/guidelines_for_population_level_management.pdf)

As well as providing unique genetic insights, the results have implications for management and conservation. According to the authors, the long-distance dispersal of the species warrants its management across Europe.

The golden jackal has been declared an alien and potentially invasive species in the Baltic States. The researchers suggest this is invalid, as it does not meet the criteria for an IAS. Although population size has rapidly increased, there is limited evidence that this represents a threat to local biodiversity. Importantly, this study shows the golden jackal also does not meet the third criteria for an IAS – to be non-native and introduced by humans.

Currently, the golden jackal is listed as an Annex V species under the [Habitats Directive](#). In light of their findings, the authors recommend that it should be monitored and its favourable conservation status ensured in all Member States within the current species range. The authors suggest developing cross-boundary strategies for management and documents like those developed for Europe's other large carnivores<sup>1</sup>. They also recommend a focus on population-level rather than national-level management, citing considerable differences between countries, in some of which (e.g. Greece) the golden jackal is without any legal status.

