The Distribution of Grey Wolves in the Caucasus Ecoregion and their Potential Competition to Golden Jackals

Karoline Gerbatsch, Master Thesis

Abstract

The grey wolf Canis lupus is the most widely distributed predator in the Northern hemisphere. It was once spread all over Eurasia, but the numbers went down in the last centuries, due to hunting and habitat destruction. Still, the grey wolf is one of the most important apex predators in the Caucasus Ecoregion. The wolf is on top of the food chain and controls actively and passively numbers of other species in the ecosystem. Mesopredators, such as the golden jackal Canis aureus are said to be in competition with the grey wolf. The interactions between mesopredators and apex predators are not easy to measure, as influences from the outside, often through human impact, change the balance of the ecosystem. One way to address this relationship is to compare their respective potential habitats and what the crucial characteristics of those are. Creating a species distribution model (SDM) allows me to identify the suitable habitat of the grey wolf based on occurrence points collected all over the region. The MaxEnt algorithms are especially convenient for presence-only data. Testing several combinations of predictor variables, I determined forest share, climatic variables but also anthropogenic factors, like road density as very important for the wolves' habitat selection. The SDM shows that large patches of the Caucasus are suitable habitat for the grey wolf, but often torn apart, probably a sign of habitat fragmentation. Through the combination of my covariates, I could quite accurately omit heavily disturbed urban areas and confirm a preferred habitat choice below the tree line. The habitat comparison between the grey wolf and the golden jackal showed some overlap in forested regions, but overall, their habitats are largely defined by differing characteristics. This can be explained by the distinct physique of the respective species and the adaptability rate to certain landscapes, altitude mountain ranges. Although some areas suitable for jackals are mainly occupied by wolves indicating a possible mesopredator release. The findings of the thesis and resulting data sets can be a good starting point for further future research.
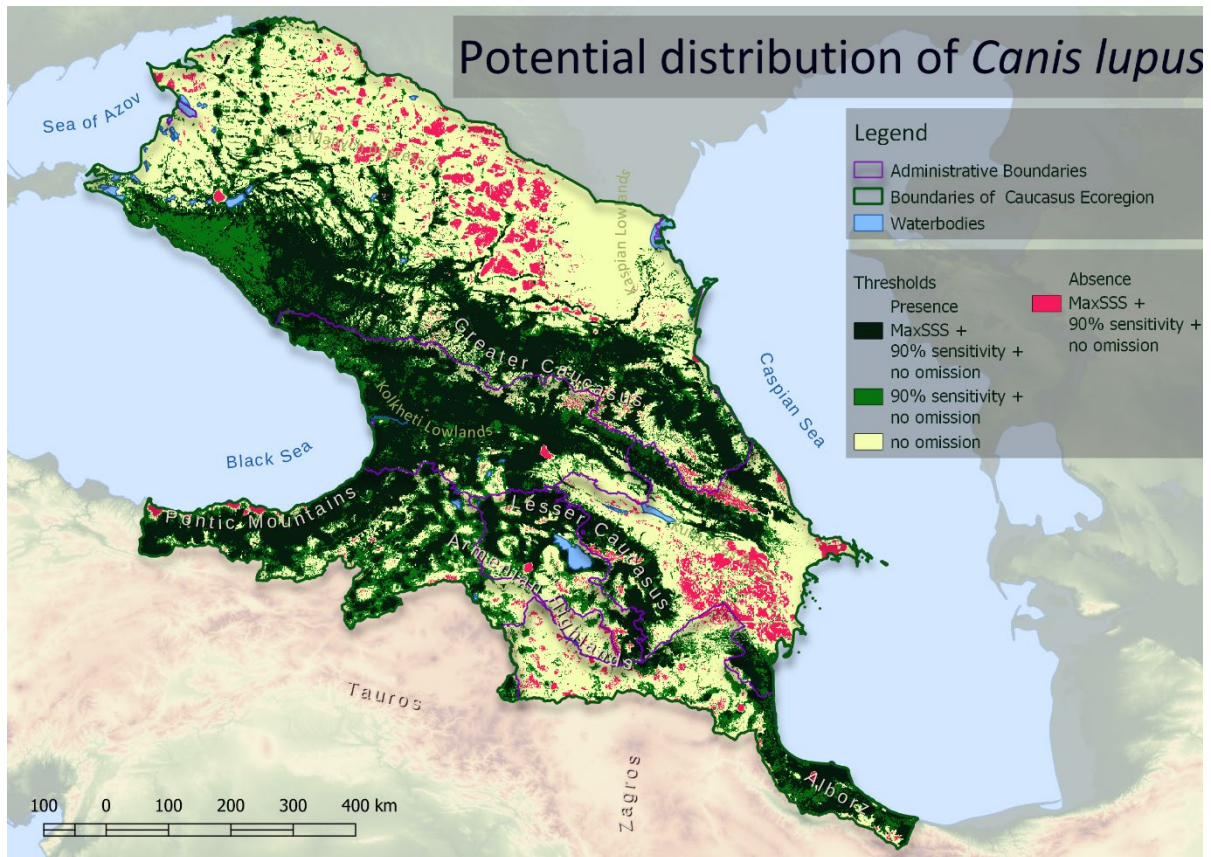
Figure 1: Potential presence – absence map of the grey wolf. I calculated three thresholds, dark green areas include MaxSSS, 90% sensitivity and no omission threshold, leaf green are 90% sensitivity and no omission threshold, light green is only the no omission threshold. Magenta areas indicate absence, as no threshold covers those areas. [Sources: administrative boundaries: GADM, Caucasus Ecoregion: WWF, DEM: SRTM, complete map: own creation]
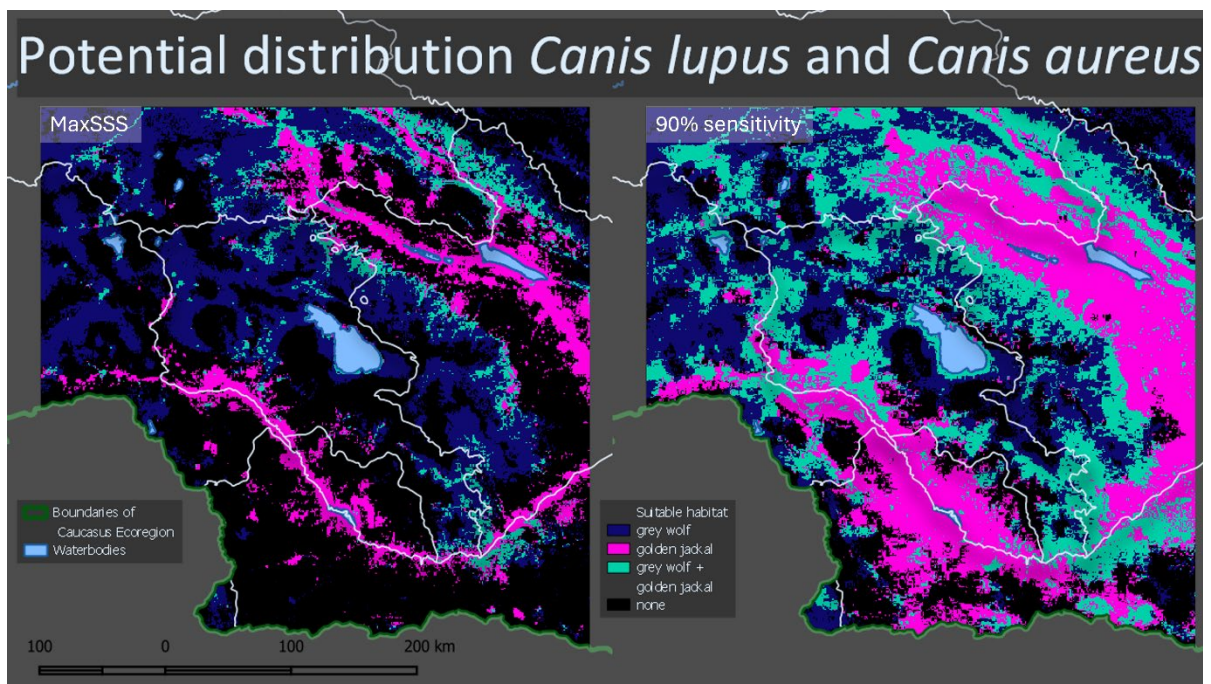

Figure 2: Potential habitat range of grey wolf and golden jackal defined by MaxSSS and 90% sensitivity threshold. Dark blue presents the potential home range of the grey wolf, pink shows the potential jackals home range and coloured in turquoise are overlapping territories
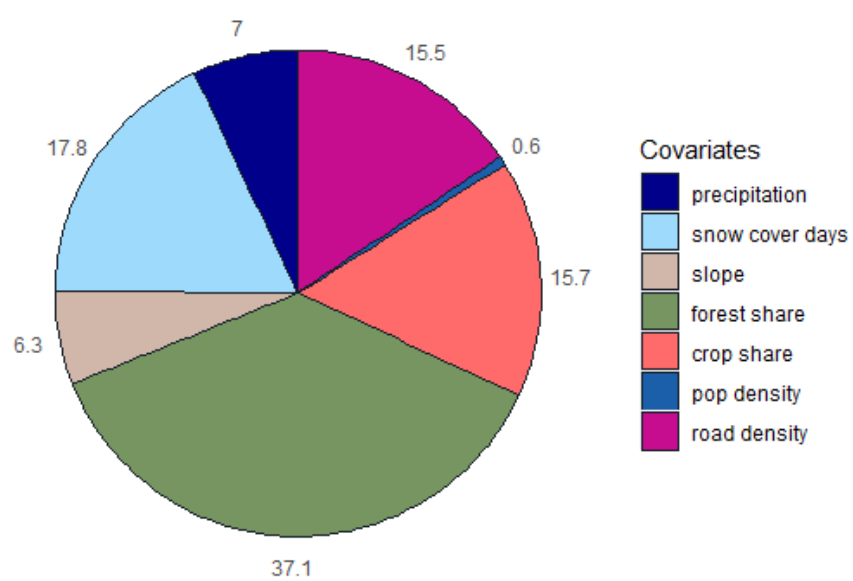
Figure 3: Contribution of predictor variables