Utilizing unique coat patterns in lynx for Spatial Capture-Recapture (SCR) analysis in Armenia

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Abstract

Accurate estimates of population densities are essential for the effective management and conservation of wildlife, especially for carnivores like the Eurasian lynx (*Lynx lynx*), due to their important role in ecosystems. While camera trap footage had proven their presence in southern Armenia, the exact population status of Eurasian lynx and their ecology remain unknown. Using camera trap data collected from 2019 to 2023 by WWF-Armenia (World Wide Fund For Nature), I tested the applicability of the pattern recognition software HotSpotter for the computer-assisted individual identification of the lynx and analyzed the population status and ecology of lynx in southern Armenia. I provided the first population size and density estimates of lynx in southern Armenia using spatial mark resight (SMR) models and analyzed the activity pattern of lynx and the activity overlap with the potential prey species, brown hare (*Lepus europaeus*) and bezoar goat (*Capra aegagrus*). While the application of the HotSpotter software was successful, the high share of low-quality camera trap images in the data set impacted the performance, and lynx were identified in only about a third of all images used. Despite the few identifications and recaptures in the study regions, the SMR analysis resulted in density estimates ranging from 1.09 to 3.98 lynx per 100 km^2, which fall within the range of other Eurasian lynx population densities. The mostly nocturnal activity pattern of lynx overlapped significantly more with brown hare compared to bezoar goat, suggesting a lagomorph prey preference of lynx in southern Armenia. The study represents only a first attempt at providing information on the understudied Eurasian lynx population in the South Caucasus, underscoring that further research dedicated to lynx is needed.
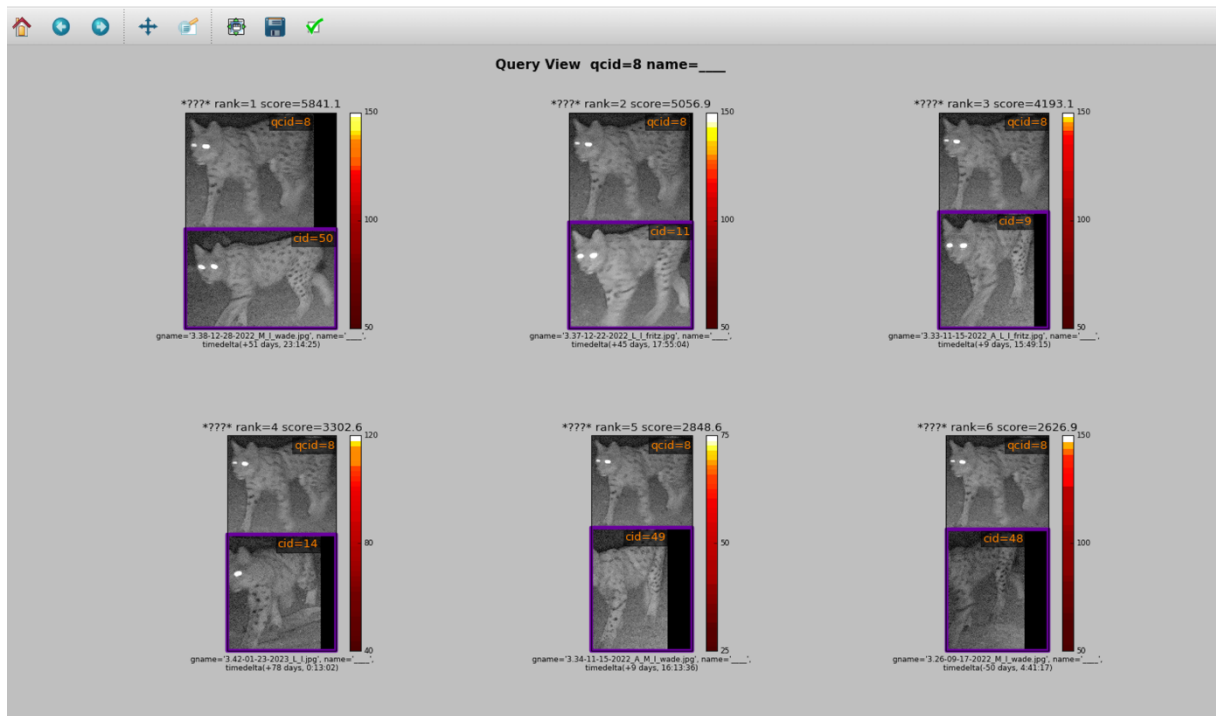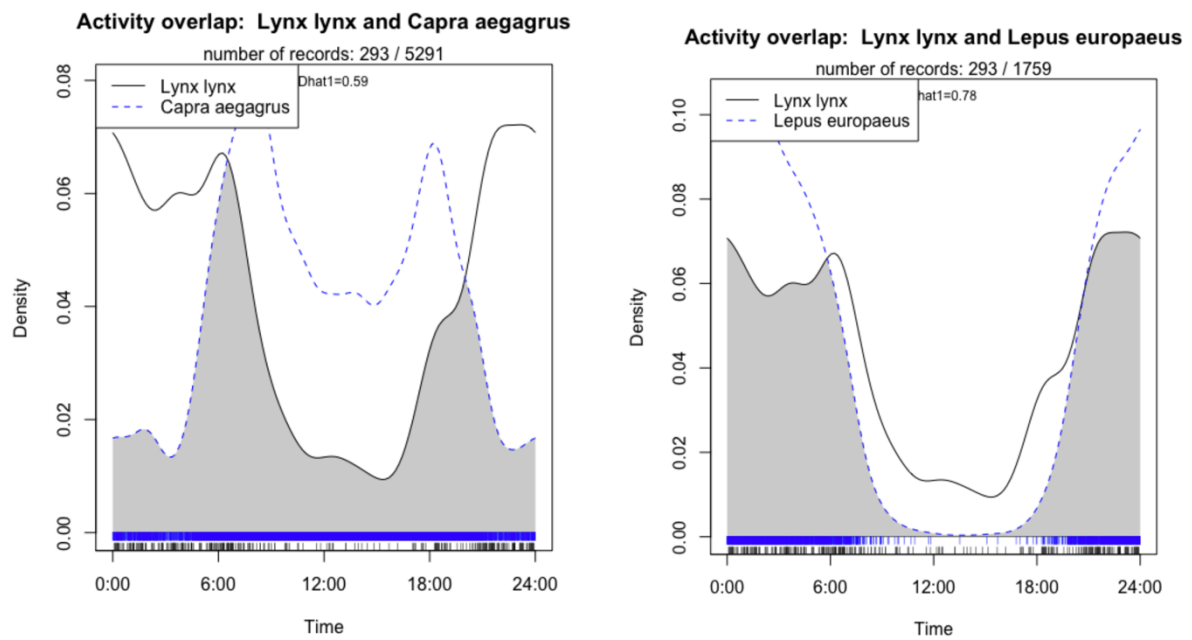
Figure 1 HotSpotter Analysis

Figure 2 Abstract