ABSTRACT

This thesis deals with an endangered large mammal species - snow leopard, its distribution, population dynamics, landscape genetics and connectivity, trophic ecology and human-snow leopard conflicts in the Nepalese Himalaya (Sagarmatha National Park (SNP), Lower Mustang (LM) and Upper Manang (UM) in the Annapurna Conservation Area, during Wet and Dry seasons in 2014–2016. In the case of snow leopard study, we used data obtained from camera traps, scat's genetic analysis and monitoring of fresh pugmarks and scrapes while direct count method was used to study for its main prey, blue sheep and Himalayan tahr.

In **study 1**, we assessed the determinants of habitat suitability of snow leopards using MaxEnt model and mapped the distribution of suitable habitat for snow leopards in Nepal. Altitude and Annual mean temperature are important common factors contributing to snow leopard habitat suitability within the area studied, which is indicated by both the percentage contribution of environmental variables and Jackknife test from MaxEnt model. Some other uncommon factors also seem to play a role, as they were important in at least one of the analyses. These were: distance from road, and precipitation of driest month but their importance has to be considered with caution.

In **study 2,** we present our observations along with other published data on population abundance and trend in changes of population sizes of snow leopard and its main prey, Himalayan tahr and blue sheep in the three study areas. Additionally, population data of the main leopard prey (sex ratio, female to cub ratio), wherever these values were available, are also presented. The basic analyses of these data performed yield predictions useful for developing of effective snow leopard management strategies.

In **study 3**, we use our data collected in Nepal to determine the areas suitable for snow leopards, by using habitat suitability maps, and describe the genetic structure of the snow leopard within and between these areas. We also determine the influence of landscape features on the genetic structure of its populations and reveal corridors connecting suitable areas. We conclude that it is necessary to protect these natural corridors to maintain the possibility of snow leopards' migration between suitable areas, which will enable gene flow between the diminishing populations and thus maintain a viable metapopulation of snow leopards.

In **study 4,** we studied diet and prey preference of snow leopards in the three studied areas. We collected 268 scats along 139.3 km linear transects, of which 122 were genetically confirmed to belong to snow leopards. Their diet was identified by comparing hairs in scats with our reference collection of the hairs of potential prey. In the SNP, the most frequent prey in snow leopard faeces was the Himalayan tahr in both winter and summer. In LM and UM, its main prey was blue sheep in winter, but yak and goat in summer. In terms of relative biomass consumed, yak was the main prey everywhere in both seasons. Snow leopards preferred large prey and avoided small prey in summer but not in winter, with regional differences. It preferred domestic to wild prey only in winter, and in SNP. We show that snow leopards consume a diverse range of prey, which varies both regionally and seasonally. We conclude that in order to conserve snow leopards it is also necessary to conserve its main wild species of prey, which will reduce the incidence of losses of livestock.

In **study 5,** we assess how the knowledge and perception of local people of snow leopard depredation has changed over time and its correlation with livestock losses in the central and north-eastern Himalayas in Nepal. We conclude that there is still a major threat to the long-term survival of snow leopards and its natural prey in the areas studied. Mitigation measures identified during discussions with local people should be applied to create a win-win situation for both local people and the long-term survival of snow leopards.