

Major causes of mortality in Alpine ibex: impact, ecology, actions

Marco Giacometti

Wildvet Projects, CH-7605 Stampa, marco.giacometti@wildvet-projects.ch

Alpine ibex is susceptible for a large number of diseases which can affect also other species of the Caprinae group. However, only relatively few diseases frequently lead to clinical disease and mortality. Causes of death with a potential impact on population dynamics include infectious diseases such as contagious ecthyma (orf), pasteurellosis, infectious keratoconjunctivitis, foot rot, and sarcoptic mange. Other important causes of death (avalanches, starvation, predation) have a non-infectious character. In some cases, disease is induced by several factors (infectious and non-infectious) acting contemporaneously on the health status of the animals (multifactorial diseases). This is the case for pasteurellosis of adult ibex and for perinatal mortality, which strongly affects survival of kids and hence dynamics of ibex populations. Particular zoonotic infections occur in Alpine ibex in some areas, but generally cause only sporadic cases of disease. Examples of such infections are brucellosis, pseudotuberculosis, and paratuberculosis. In infections such as chlamydiosis, salmonellosis, Q fever, and Caprine Arthritis Encephalitis occurrence and impact are currently not sufficiently known in Alpine ibex. Mortality pattern in free-ranging Alpine ibex shows strong interannual differences indicating an influence of environmental parameters such as food resources and weather, in particular snow. Patterns of mortality are modulated also by population structure (age and sex). However, interpretation of statistics based on animals found dead can lead to the erroneous interpretation of biological processes due to selection bias. E.g. perished middle-aged and aged males are usually found with higher probability than females and juveniles. Under particular circumstances (such as newly founded populations in marginal habitats), disease and mortality patterns can significantly differ from the situation found in settled Alpine ibex populations in the Alps and these should therefore not be taken as classical models. Most of the significant infectious agents including *Parapoxvirus ovis*, *Pasteurella* spp., *Mycoplasma conjunctivae*, *Dichelobacter nodosus*, *Brucella abortus*, *B. melitensis*, *Corynebacterium pseudotuberculosis*, *Mycobacterium paratuberculosis*, and *Sarcoptes scabiei* var. *caprae* can be transmitted between domestic and wild Caprinae species. Transmission routes include direct contact, aerosols, insects, and inanimate vehicles such as the soil or plants. Use of common pastures and short distance encounters between individuals of different host species play the most important role in the inter-species transmission of infectious agents. For the development of measures to control diseases it is of crucial importance to distinguish infections which are self-maintained in wild Caprinae populations (e.g. sarcoptic mange, pasteurellosis) from those requiring boost from livestock (e.g. infectious keratoconjunctivitis, foot rot, brucellosis). In some diseases such as orf, pseudotuberculosis and paratuberculosis, the question whether wild Caprinae do maintain the infection or not is still open. Measures to control diseases in Alpine ibex include an accurate monitoring of the occurrence and the impact of diseases. Here, improvements are possible. To improve monitoring of Alpine ibex diseases we suggest to edit a web atlas by the IUCN Caprinae Specialist Group jointly with the Gruppo Stambecco Europa. To prevent diseases it is of particular importance to improve health status and tending of domestic livestock and to consider appropriate translocation policies of wild animals. Finally, eradication of livestock from diseases such as footrot and brucellosis – both is realisable today – leads to the self-eradication of these diseases in ibex populations.