Carnivore Ecology and Conservation

A Handbook of Techniques

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Investigating cause-specific mortality and diseases in carnivores: tools and techniques

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Conservation of carnivores entails an understanding of ecology and life-history requirements of species, which is essential for identifying the factors limiting or threatening populations. Because population growth and persistence relate to mortality and fecundity, identification of threats requires thorough characterization of cause-specific mortality or causes of low fecundity, along with representative sampling to ensure an unbiased perspective on the relative importance of specific causes. Disease, as a potential cause of mortality or influence on reproductive success, can be easy to overlook as a contributing cause of population decline. For this reason, a working knowledge of disease processes at individual and population levels, and basic methods to study these processes, are vital to biologists and managers involved in carnivore conservation. In this chapter, we describe several tools and techniques for collecting biological data and samples to study cause-specific mortality and the presence of pathogens and disease in carnivores, and emphasize the necessity for thoroughness and representativeness. We offer a variety of ways to analyze mortality and disease data through epizootiological studies and modeling programs. Lastly, we present a variety of commonly used disease-intervention programs for the prevention or control of detrimental pathogens in carnivore populations.

13.1 Determining causes of mortality in carnivores

Studies of sources of mortality should accomplish two objectives: thorough understanding of the direct and indirect reasons for the death of each individual, and the relative frequency and importance of each contributing cause of mortality to the population as a whole. The latter requires representative sampling, a sufficiently large sample size, and knowledge of whether sources are additive or compensatory,