
PROACTIVE MANAGEMENT OF PNEUMONIA EPIZOOTICS IN BIGHORN SHEEP IN MONTANA—PROJECT UPDATE

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Pneumonia epizootics are a major challenge for effective management of bighorn sheep (*Ovis canadensis*). Approximately half of the herds in Montana have suffered die-offs since the 1980s, many of which were pneumonia events. A set of models that identify risk of pneumonia and the best management decisions given that risk would be of great value for proactive management of pneumonia epizootics. Our first objective is to design and test a risk model that will help predict a herd's risk of pneumonia. We hypothesize that various factors increase risk through pathogen exposure, pathogen spread, and disease susceptibility. Analysis of these factors comparing herds with and without recent pneumonia histories using Bayesian logistic regression will allow us to design a risk model. Our second objective is to develop a proactive decision model that incorporates estimates of pneumonia risk to help evaluate costs and benefits of alternative proactive actions appropriate to those estimates. We will use a Structured Decision Making framework, which provides a deliberative, transparent, and defensible decision-making process that is particularly valuable in complex decision-making environments such as wildlife disease management. Together the resulting risk and decision models, to be completed this year, will help managers estimate pneumonia risk and identify the best management action based on both the severity of each herd's predicted risk and costs and benefits of competing management alternatives. Ultimately, this project will demonstrate the development and application of risk and decision models for proactive wildlife health programs in Montana Fish, Wildlife and Parks.