OPTIMAL USE OF WILDLIFE MONITORING RESOURCES

Charles R. Henderson Jr.*, Wildlife Biology Program, University of Montana, Missoula
Paul M. Lukacs, Wildlife Biology Program, University of Montana, Missoula
Mark A. Hurley, Wildlife Research Supervisor, Idaho Department of Fish and Game, Boise

*Indicates Presenter
**Indicates Student Presentation

Resources for monitoring wildlife populations are limited and their availability changes over time. The data collected using these resources is critical for making good conservation and management decisions. Determining the optimal way to allocate monitoring resources for data collection based on the amount of information the data provides for conservation and management is a responsible and efficient use of public resources. We develop a method for determining the most optimal scenarios for data collection which simultaneously minimizes cost and maximizes the precision of the abundance estimate. To accomplish this, we developed a new metric which describes the relationship between data collection cost and estimate precision in a single value, the information gain ratio. We used data collected by the Idaho Department of Fish and Game on the statewide mule deer population of Idaho to develop our method for determining the optimal allocation of monitoring resources. Using the information gain ratio, we characterize the relationship between cost and precision relative to the specific attributes of each mule deer population management unit. Our method allowed us to generate a set of data collection scenarios that were adapted to the specific characteristics of each unit, changed with the availability of monitoring resources, and are easily comparable via the predicted values of the information gain ratio. The collection scenarios detail the type and amount of each data type to collect for the optimal use of monitoring resources. Our optimization method is adaptable across species, scales, data types, and population models.