

METHODS TO ESTIMATE RECRUITMENT FOR SOCIAL SPECIES WITH LIMITED DATA

Allison C Keever*, MT Cooperative Wildlife Research Unit, University of Montana, Missoula
Michael S. Mitchell, MT Cooperative Wildlife Research Unit, US Geological Survey, Missoula
Kevin M. Podruzny, Wildlife Division, Montana Fish, Wildlife & Parks, Helena

*Indicates Presenter

**Indicates Student Presentation

Population dynamics for social species depend on hierarchical demography that links local, group-level processes to overall population growth. Many social species cooperatively breed, thus recruitment of offspring is affected by both population- and group-level processes. Traditional methods to estimate recruitment for a species that cooperatively breeds may be insufficient because they do not account for hierarchical demography. Furthermore, for a species that is broad-ranging, rare, or elusive, recruitment data may be too difficult or costly to collect. Our objective was to develop a method to estimate recruitment for a social species that accounts for hierarchical demography and does not rely on recruitment data. We developed an integrated population model (IPM), with both population- and group-level processes, to estimate recruitment in a social species. We were able to estimate recruitment from the IPM without data because changes in abundance are a function of survival and recruitment and we had data for survival. We tested the model using simulated datasets under five scenarios without recruitment data. For all five scenarios we ran models with and without the group-level process to determine if hierarchical demography improved estimation. Simulations demonstrated that the model performed well under most scenarios and provided unbiased estimates of recruitment. We found that explicitly incorporating hierarchical demography was important for estimating recruitment in social species. This model can easily be adjusted to estimate recruitment for any social species. Further, by removing the group-level process this model can be used to estimate recruitment for a non-social species when data are lacking.