Assessing Age Structure, Winter Ticks and Nutritional Condition as Potential Drivers of Fecundity in Montana Moose

Jesse R. Newby*, Montana Fish, Wildlife & Parks, Kalispell
Nicholas J. DeCesare, Montana Fish, Wildlife & Parks, Missoula
Justin A. Gude, Montana Fish, Wildlife & Parks, Helena

Fecundity in ungulates is an important component of population dynamics, and itself can be driven by differences in the age and nutritional condition of females. As one element of a larger research project focused on moose (*Alces alces*) population dynamics and ecology, we examined nutritional condition, pregnancy rates, and litter sizes for moose in three Montana

moose populations. During the winters of 2013–2015 we captured 100 female moose ≥ 1 year old and assessed pregnancy status using assays of both serum (pregnancy specific protein B [PSPB]) and feces (fecal progesterone). After calibrating the relationship between these two assays, we subsequently monitored pregnancy with feces alone for additional winters following capture. Coincident with captures, animals were aged using tooth extraction and cementum analysis, nutritional condition was assessed using ultrasonography of rump fat thickness, and winter tick loads were estimated by counting ticks along transects of the rump and shoulder. Additionally, the concentrations of nitrogen and neutral detergent fiber of winter pellets were measured during each winter as indices of dietary quality. Here, we assess the importance of environmental and demographic factors in limiting moose productivity in Montana by examining the interdependence of forage, parasites, nutritional condition, age structure, and ultimately fecundity for female moose. We then place these findings in context of fecundity rates observed for moose elsewhere within neighboring US Rocky Mountain populations and across North America.