

Causes and Drivers of Mortality for Sitka Black-Tailed Deer Fawns in GMU 2

Edited by R. Flynn

Sophie Gilbert and Dave Person studied deer fawn survival on central POW during 2010-2012. They captured 54 adult female deer during April and May of each year and fitted them with GPS collars and a vaginal implant transmitter (VIT) if pregnant at parturition, fawns were radiocollared. In addition, neonatal deer fawns were collared opportunistically when encountered in the field.

Fawn survival was lowest during the summer, due primarily to predation by black bears. Average summer survival across the three years of the study was 0.43 ($n = 45$, $SE = 0.07$), and quite variable among years. Across all years, mortality rates were 0.46 ($n = 21$, $SE = 0.08$) due to black bear predation, and 0.11 ($n = 5$, $SE = 0.05$) due to other causes. Other causes of mortality included unknown predation ($n = 1$), eagle predation ($n = 1$), drowning ($n = 1$), and premature birth ($n = 3$). Maternal mass and age were correlated ($r = 0.56$).

During the winter months, fawn survival was determined primarily by malnutrition-caused mortality, which occurred only during the winter of 2011. Across the three years of the study, the average winter survival rate was 0.71 ($n = 81$, $SE = 0.05$), due to a mortality rate of 0.21 ($n = 16$, $SE = 0.05$) from malnutrition, 0.03 ($n = 2$, $SE = 0.02$) from wolf predation, 0.02 ($n = 1$, $SE = 0.02$) from bear predation (in late September), and 0.03 ($n = 2$, $SE = 0.02$) due to other causes ($n = 1$ car collision, $n = 1$ illegal hunting). Between years, winter survival rates were high in 2010 ($M = 0.86$, $SE = 0.08$) and 2012 ($M = 0.87$, $SE = 0.10$), and quite low in 2011 ($M = 0.35$, $SE = 0.10$).

Winter fawn survival, from 91 through 365 days of age, was strongly affected by winter severity, birthdate, and the interactive effect of late birthdate in severe winters. This translates to lower survival during severe winters and for late-born fawns, with a magnified negative effect on late-born fawns during severe winters.

Overall, fawn survival rather than adult female survival drove inter-annual variation in population growth for deer. Fawn survival was caused primarily by black bears in summer and by starvation due to deep snowfall during winter. The most influential factors were mass at birth in summer, and date of birth and winter severity in winter. Wolf predation was nonexistent for adult females during this study, and very low for fawns. Black bear predation was correlated with mass at birth, indicating that it is linked with nutritional condition and thus is at least partially compensatory.