# What Can We Learn From Calf/Cow Ratios?

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Trends in population growth can be monitored with data for key vital rates without requiring knowledge of abundance. Adult female survival has the highest elasticity for ungulate population dynamics, but the more variable recruitment rates can be better predictors of local variation in growth rates. Recruitment is often monitored using young adult age ratios, which are difficult to reliably interpret given the contribution of multiple vital rates to annual ratios. We show how concurrent monitoring of adult female survival and age ratios allows both retrospective estimation of empirical population growth rates and the decomposition of recruitment-specific vital rates. We demonstrate the estimation of recruitment and population growth rates for one woodland caribou population using these methods, including elasticity and life-stage simulation analysis of the relative contribution of adult female survival and recruitment rates to variation in population growth. We show, for this woodland caribou population, that adult survival and recruitment rates are nearly equivalent drivers of population growth rates. We recommend the concurrent monitoring of adult female survival to reliably interpret age ratios when managing caribou and other ungulates.